TOBACCO BASICS HANDBOOK

2002 EDITION

AADAC
Alberta Alcohol and Drug Abuse Commission
An Agency of the Government of Alberta

alberta
HEALTH FIRST

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For additional copies, contact:

Alberta Alcohol and Drug Abuse Commission (AADAC)
2nd Floor, 10909 Jasper Avenue, Edmonton, AB T5J 3M9
PHONE: (780) 427-7319 FAX: (780) 422-5237

For more information, contact the AADAC Tobacco Reduction Unit at (780) 422-1350.

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The Tobacco Basics Handbook

The *Tobacco Basics Handbook* is designed to provide a strong base of tobacco-related information that can be adapted for any audience. Staying current in this vast and ever-changing field can be a challenge. The handbook brings together a range of reliable facts and figures, and places them at your fingertips.

More than a reference

This handbook is intended primarily for people working within tobacco reduction, but it has been written to be easily adapted to a wide range of communications. The *Tobacco Basics Handbook*, provides clear, readable information in sections that can be used independently as stand-alone fact sheets. Because the chapters are designed to be used independently, you will see information repeated in some sections.

In the handbook, you'll find information that is

- **Alberta specific**

  Where possible, this handbook uses Alberta data and puts the issues in a context that is relevant to people in this province. In addition, Canadian and world statistics are provided where Alberta data are not available or are used to represent Alberta information where no provincial statistics are available.

- **Research-based and fully referenced**

  Most of the information in the handbook is based on articles from peer-reviewed journals. Every effort has been made to check the accuracy of the information and to ensure that a substantial body of evidence supports each fact.

- **Up-to-date**

  Research in this field changes every day. This handbook is based on current studies and surveys, and will be updated from time to time as necessary.

How to use this handbook

Because people need varying levels of information, this handbook is designed to accommodate several types of readers:

- "Skimmers" can gather key information by referring to the "Quick Facts" at the start of each section and by reading the bold text on each page.

- Readers who would like more information can read the supporting information that appears below the bold text.
- Further details and related information can be found in the margins, and in the full page explanations that appear in some of the sections.

Choose the level of detail you require.

SMOKING PREVALENCE

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Quick Facts

Canada

- 25.9% of Canadians aged 12+ currently smoke (21.5% are daily smokers and 4.4% smoke occasionally).
- Smoking rates in Canada are higher among men (28.0%) than women (23.7%).
- Smoking rates of daily and occasional smokers (i.e., current smokers) in Canada are highest among 20-24 year olds. Males have a higher rate (37.3%), compared to women in this age group (32.6%).
- Smoking among teens aged 12-19 has been rising since 1990 and is now at 18.7%.
- Smoking among Aboriginals is much higher than the national average (63%).
- 3% of Canadians use cigars/cigarillos.
- 1% of Canadians use spit tobacco.

Alberta

- 27.6% of Albertans currently smoke (22.9% smoke daily and 4.7% are occasional smokers).
- The highest prevalence in Alberta is among 20-24 year olds (37.8%).
- Spit tobacco rates in Alberta are higher than the national average (1.4%).
- Spit tobacco experimentation rates among teens in Alberta are double the national average (20% for chewing tobacco/moist snuff and 7% for dry snuff).

SMOKING PREVALENCE

Smoking rates in Canada rose steadily in the 1900s, reaching their peak in the mid-1960s. The decline of smoking coincides with the start of tobacco reduction efforts among government, health organizations and citizen groups.

Today, smoking is no longer considered the norm: 73.9% of Canadians do *not* smoke (that is, 71.6% of males and 76.1% of females) age 12 and over.[1]

The Big Picture

Cigarette smoking was once so common that it was difficult to imagine a world without it. However, for thousands of years, consistent tobacco use was not the norm. In fact, high prevalence of smoking and regular consumption of tobacco are historically unusual.

Tobacco was used as far back as the first millennium by people in North and South America for ceremonial, religious and medicinal purposes. In the 15th century, it spread to Europe in the form of pipe tobacco, cigars, chewing tobacco and snuff. At that time, tobacco was used in small amounts by select portions of the world's population.

The widespread, global use of tobacco – particularly cigarettes – is a 20th and 21st century phenomenon.

Cigarettes started gaining popularity in the western world in the middle of the 19th century,[2] but it was the invention of the cigarette-rolling machine in 1881 that triggered the steep rise in cigarette consumption in the 20th and 21st centuries. However, by the 1980s, this pattern began to change:[3]

- **1970-72:** Canadians consumed an average of 3,910 cigarettes per adult (15 years and older), every year.
- **1980-82:** Ten years later, the average annual rate of cigarette consumption began to slightly decline to 3,800 cigarettes per adult (15 years and older).
- **1990-92:** Twenty years later Canadians were smoking an average of 2,540 cigarettes per adult (15 years and older), every year.
- **Trends in Alberta:** Between 1980 and 2001 the domestic cigarette sales in Alberta have declined from 7.1 billion cigarettes in 1980 to 4.7 billion in 2001.[4]

In one century, then, we've seen the dramatic rise of cigarette smoking, and we've seen the beginning of its decline.

Smoking prevalence in Canada has declined over 24% since 1965.[3]

Smoking rates began declining in Canada and the western world when the health consequences of smoking were made public in the 1960s with reports such as the U.S. Surgeon General's report on smoking and health (1964).[4]

Canada once had a per capita consumption that was higher than any other country in the world,[5] but this has changed. Today there are slightly more Canadians who have quit smoking (36.7%) than there are smokers (25.9%).[1] In Alberta there is a similar trend. Almost 8% more Albertans have quit smoking compared to those who are current smokers: 35.2% are former smokers and 27.6% are current smokers, according to the 2000/2001 Canadian Community Health Survey.[1]

Not only are fewer Canadians smoking than two decades ago, they are smoking less. In 1981, daily smokers consumed an average of 21 cigarettes per day. Since then, the number of cigarettes smoked has been gradually but steadily declining to the current average of 16 cigarettes per day.[6]

Canadian Smoking Rates

According to data from the 2000/2001 Canadian Community Health Survey (CCHS) and the 2001 Canadian Tobacco Use Monitoring Survey (CTUMS):[1]

- There are 25.9% of Canadians (aged 12 years and older) who currently smoke.[1]
- Of this 25.9% of current smokers, 21.5% of Canadians are daily smokers, and 4.4% are occasional (non-daily) smokers.[1]
- Smoking prevalence is higher among men than women: 28% of Canadian males aged 12+ smoke compared to 23.7% of females.[1]
- Men smoke more cigarettes per day than women: the male average among daily smokers is 17 cigarettes per day; the female average is 15.[7]
- Smoking rates among males are higher in every age category except one – 12-19 year olds – where a higher percentage of females smoke (19.8%) than males (17.6%).[1]
- Smoking prevalence among males and females is highest for the 20-24 years age group (37.3% for males versus 32.6% for females).[1]

At Risk Groups

Few people begin smoking after the age of 20, although a study of American college students suggests that this trend could be changing; the study found that 15% of college smokers had their first cigarette on or after 19 years of age, and 2% began smoking regularly on or after that age.

Young Canadians are especially at risk.

While smoking rates in this country have dropped over the past decade, rates among young people substantially increased in the early 1990s and have since been slowly declining.

- Smoking rates for youth have begun to significantly decrease in recent years. The rate for teen smokers aged 12-19 climbed in the early 1990s, but has been slowly declining in the past few years to 18.7% in 2001.[1]
- Young adults aged 20-24 still have the highest smoking rate of any age group, at 35%. The smoking rate for males aged 20-24, which was 47% in 1981, was 37.3% in 2001. In 1981, the rate for 20-24 year old females was even higher than that for males, at 50%. In 2001 it was 32.6%.[1]
- Today, 18.7% of Canadian teens (12-19) smoke.[1]
- More than a third of current and former smokers began smoking before their 15th birthday.[10]
- The 2000/01 Canadian Community Health Survey found that 38% of current and former smokers aged 12 and over began smoking before their 15th birthday. In fact, 8% of them began smoking between the ages of five and 11 years old.[10]
- Overall, males were almost twice as likely as females to have smoked their first cigarette between ages five and 11 years old. Alberta had a 9% smoking initiation rate for ages five to 11 years old. Nunavut had the highest rate of smoking initiation for this age group at 19%; significantly higher than the Canadian average (8%).[10]

The 2000/01 Canadian Community Health Survey identified smoking initiation ages for youth in the 17 regional health authorities in Alberta. The following table provides this information. The highlighted values indicate the highest proportion among the RHAs for each age category.[10]

Smoking Initiation in Alberta by Regional Health Authority, 2000/01 (%)[10]

Regional Health Authority	Smoking initiation age (5-11years)	Smoking initiation age (12-14 years)	Smoking initiation age (15-19 years)	Smoking initiation age (20 years and over)
Chinook RHA	E*	26.1	[illegible]	10.1
Palliser RHA	8.2	31.6	44.6	E*
Headwaters RHA	E*	31.1	48.4	10.0
Calgary RHA	8.7	31.7	45.5	12.0
RHA #5	E*	29.4	45.6	10.8
David Thompson RHA	11.4	33.3	45.2	8.5
East Central RHA	[illegible]	29.6	44.4	10.5
Westview RHA	E*	34.1	46.6	E*
Crossroads RHA	E*	34.6	45.2	E*
Capital RHA	8.1	26.9	48.1	[illegible]
Aspen RHA	E*	31.1	45.5	9.8
Lakeland RHA	11.7	29.9	45.7	10.8
Mistahia RHA	8.1	38.2	41.9	10.1
Peace RHA	E*	32.6	43.9	9.8
Keeweetinok Lakes RHA	E*	37.6	40.3	E*
Northern Lights RHA	10.0	34.3	44.9	E*
Northwestern RHA	E*	[illegible]	40.5	E*
Alberta	**9.1**	**30.4**	**46.2**	**11.7**

E* – results not reliable due to small numbers

Youth Access to Cigarettes

Forty percent of Canadian youth (15-19 years old) identified friends and peers as their main influence in smoking initiation. These youth obtained cigarettes from three main sources: small convenience stores (53%), friends (19%) and gas stations (12%). Among youth aged 15-17 years old, 14% bought cigarettes from friends who were of legal age to purchase them, and 41% bought them mainly from a small convenience store. Just over half (54%) of young smokers (15-17 years old) reported that they were asked their age when trying to buy cigarettes.[11]

According to the Aboriginal Peoples Survey (1991), Inuit people have the highest prevalence of tobacco use among Aboriginals:[11]

Inuit	72%
Metis	57%
First Nations	56%

Other at risk groups are Aboriginals, people with a lower formal education, and "blue collar" workers – all of these groups have higher smoking prevalence rates.

- Aboriginal peoples (First Nations, Metis and Inuit) have much higher smoking rates than the rest of the population: an estimated 63% of all Aboriginals smoke[11] – more than double the rate for Canadians as a whole.
- People with a lower formal education smoke more than the rest of the population: 33% of people who have less than secondary education smoke, compared to 23% of people with a college or university degree.[15]
- People working in male-dominated, blue collar industries smoke more than the rest of the population: smoking prevalence among blue collar workers is 14% to 27% higher than the national average.[15]

Alberta Smoking Rates

Alberta's smoking prevalence rates are higher than Canadian rates.

According to data from the 2000/01 Canadian Community Health Survey (CCHS):[1]

- 27.6% of Albertans (12+ years) are current smokers (22.9% smoke daily and 4.7% are occasional smokers).
- A higher proportion of men (12+ years) are current smokers (29.6%) than women (29.5%) in Alberta.
- The highest prevalence of smoking is among 20-24 year olds (37.8%).
- In Alberta, 18.7% of youths 12-19 years old are current smokers.
- A higher proportion of males aged 20-24 are current smokers (41.1%) than females (34.2%).

Quit Rates

The 2001 Canadian Tobacco Use Monitoring Survey (CTUMS) documented the quit attempts made by Canadians and Albertans.

When asked about attempts made to quit smoking, the responses are similar for males and females in Canada. About half (51%) of Canadian smokers made no attempts to quit smoking in the past 12 months. Approximately 38% made one to three attempts and 12% made four or more attempts in the past 12 months. Youth make more attempts to quit smoking as compared to adults.[16]

For smokers in Alberta, 55% made no attempts to quit in the past 12 months while 33% made one to three attempts to quit over this time period.[17]

Canadian smokers who "recently" quit smoking less than a year ago (short-term quitters) or have "successfully" quit smoking one year ago or more (long-term quitters) comprised 52% of all those who ever smoked, as described in the 2001 Canadian Tobacco Use Monitoring Survey. Specifically, 3% were short-term quitters and 48% long-term quitters.[18]

Rates for Other Tobacco Products

Spit tobacco

About 1% of Canadians (aged 15+) use spit tobacco. In the mid-1980s, spit tobacco use was found to be higher in Western Canada than it was nationally, and was more common among athletes, Aboriginals, men working in outdoor occupations and rural men.[19]

According to the 1999 Canadian Tobacco Monitoring Survey (CTUMS), 1.4% of Albertans use spit tobacco. This rate is higher than the national average, and significantly higher than most of the other provinces (eight of which have rates below 0.5%).[20] These percentages are likely similar today given the small percentage of Canadians and Albertans who use spit tobacco products.

Experimentation rates in Alberta are also high: a 1994 national survey determined that 20% of Alberta youth aged 10-19 had tried chewing tobacco or moist snuff, and 7% had tried dry snuff. These rates are over double the national average (8% of Canadian youth had tried chewing tobacco and 3% had tried dry snuff in 1994).[2]

Cigars, cigarillos and pipes

Beginning in the mid-1980s, the cigar industry intensified its public relations efforts in the US through strategies such as cigar dinners, product placement, feature stories, sporting events and the development of cigar-friendly lifestyle magazines (such as Cigar Aficionado).[21] Between 1993 and 1998, US prevalence increased by about 50%.[22] Cigar smoking is also on the rise in Canada.

While cigarette smoking has steadily declined in the past decade, cigar prevalence in Canada is now as high as it was in 1986.[23]

About 5% of males (3% of the total population) smoke cigars or cigarillos – that's about 650,000 men aged 15 and older.[20]

Unlike cigar use, pipe use has been declining over the past 30 years. While lifetime use is relatively high (29% for males, 5% for females), current use is at about 1%. Most current pipe users (66%) also smoke cigarettes.[20]

Bidis

Bidis (pronounced bee-dees) are small, hand-rolled cigarettes that are gaining popularity among young people. Made primarily in India, bidis consist of tobacco that is bundled in a tendu or temburni leaf and bound tightly with a coloured thread. They come in a variety of flavours, including chocolate, strawberry, wild cherry, licorice and grape. Their flavours are youth-friendly, but their contents are not.

Bidis generally contain higher concentrations of nicotine than name brand cigarettes.[24]

While no prevalence data have yet been collected in Canada, studies in the US show that bidi smoking is on the rise among urban youth. A recent survey among young people in Massachusetts found that 40% had smoked bidis at least once in their lifetime, and 8% had smoked 100 or more in their lifetime.[25] In 1999, the National Youth Tobacco Survey (US) included a question on bidis for the first time. The survey found that the prevalence rate for bidis (5%) was almost as high as the rate for spit tobacco.[26]

Prevalence Worldwide

While tobacco use is steadily dropping in developed countries, it is on the rise in developing nations where little money is available for health promotion, and the risks associated with smoking and spit tobacco are not widely known.[24] For every single ton of tobacco that Canadian adults gave up between 1970 and 1990, an additional 20 tons is now consumed in developing countries.[27]

Today, one in three adults, or about 1.1 billion people, smoke worldwide; of these, about 80% live in low and middle income countries.[28]

Populations are growing in developing nations, and per capita income is on the rise. These factors, together with the increase in prevalence, have led analysts to predict that within 40 years, 70% of tobacco-related deaths will occur in developing nations.[27]

TERMINOLOGY

Current Smoker: was smoking at the time of the interview, and includes daily and non-daily smokers.

Former Smoker: was not smoking at the time of the interview, but answered "Yes" to the question "Have you smoked at least 100 cigarettes in your life?"

Never Smoker: was not smoking at the time of the interview, and answered "No" to the question "Have you smoked at least 100 cigarettes in your life?"

* Daily smokers only

"E" - results not reliable due to small numbers

Source: Statistics Canada. Canadian Community Health Survey: Smoking status, by age group and sex, household population aged 12 and over, Canada, provinces, territories, health regions and peer groups 2000/01. Health Indicators, May 2002. Catalogue no. 82-221-XIE

Prevalence Tables: Canada

The following estimates are based on the 2000/01 Canadian Community Health Survey (CCHS). CCHS is a new data collection vehicle conducted by Statistics Canada to provide regular and timely cross sectional estimates and information on health determinants, health status and health systems utilization for 136 health regions across Canada. The sample size was 130,000 in 2000/2001.

Smoking Status for Canadians aged 12 and over: Canadian Community Health Survey 2000/01[1]

Age Group (in years)	Current Smokers (%)*	Daily Smokers (%)	Occasional Smokers (%)	Former Smokers (%)	Never Smokers (%)
Total (12+)	25.9	21.5	4.4	36.7	37.2
12–19	18.7	12.9	5.8	14.7	66.1
20–24	45.0	36.5	8.5	25.8	38.9
25–34	31.9	25.9	6.0	30.3	37.6
35–44	31.6	27.1	4.5	36.8	31.3
45–54	28.3	24.9	3.4	43.3	28.2
55–64	21.6	19.1	2.5	49.6	28.6
65+	12.0	10.4	1.6	51.6	36.0

* Includes both daily smokers and occasional smokers

Smoking Status by Gender for Canadians aged 12 and over: Canadian Community Health Survey 2000/01[1]

Gender	Age Group (in years)	Current Smoker(%)*	Daily Smoker(%)	Occasional Smoker(%)	Former Smoker(%)	Never Smoker(%)
Male	Total (12+)	28.0	23.5	4.5	39.6	32.0
	12–19	17.6	12.1	5.5	14.6	67.1
	20–24	37.3	29.0	8.3	26.2	36.1
	25–34	35.8	29.7	6.1	29.3	34.7
	35–44	33.8	29.2	4.6	36.9	28.9
	45–54	31.1	27.3	3.8	46.7	21.9
	55–64	22.9	20.3	2.6	56.9	20.0
	65+	13.2	11.7	E	67.7	18.7
Female	Total (12+)	23.7	19.4	4.3	33.9	42.2
	12–19	19.8	13.6	6.2	14.8	65.1
	20–24	32.6	24.0	8.6	25.4	41.8
	25–34	28.0	22.0	6.0	31.3	40.5
	35–44	29.2	24.9	4.3	36.8	33.8
	45–54	25.7	22.6	3.1	40.0	34.3
	55–64	20.4	18.0	2.4	42.4	37.0
	65+	11.2	9.5	1.7	39.1	49.5

* Includes both daily smokers and occasional smokers

Prevalence Tables: Alberta

"E" – results not reliable due to small numbers

Source: Statistics Canada. Canadian Community Health Survey: Smoking status, by age group and sex, household population aged 12 and over, Canada, provinces, territories, health regions and peer groups 2000/01. Health Indicators, May 2002. Catalogue no. 82-221-XIE

Smoking Status for Albertans aged 12 and over: Canadian Community Health Survey 2000/01[1]

Age Group (in years)	Current Smokers (%)*	Daily Smokers (%)	Occasional Smokers (%)	Former Smokers (%)	Never Smokers (%)
Total (12+)	27.6	22.9	4.7	35.2	36.8
12-19	17.9	12.5	5.4	14.1	67.2
20-24	37.8	28.0	9.8	26.3	35.8
25-34	34.1	28.7	5.4	29.5	36.1
35-44	32.1	28.1	4.0	36.7	31.0
45-54	29.5	25.6	3.9	42.3	27.7
55-64	23.8	21.3	E	48.7	26.9
65+	12.9	10.3	E	52.2	34.2

* Includes both daily smokers and occasional smokers

Smoking Status by Gender for Albertans aged 12 and over: Canadian Community Health Survey 2000/01[1]

Gender	Age Group (in years)	Current Smoker(%)*	Daily Smoker(%)	Occasional Smoker(%)	Former Smoker(%)	Never Smoker(%)
Male	Total (12+)	29.6	24.8	4.8	38.1	31.7
	12-19	16.5	11.5	E	14.3	68.4
	20-24	41.1	30.3	E	25.3	33.4
	25-34	38.6	32.7	5.9	29.9	30.8
	35-44	34.4	30.1	E	38.3	27.2
	45-54	31.4	27.3	E	46.4	21.8
	55-64	24.2	22.1	E	54.1	20.5
	65+	13.5	11.6	E	68.5	17.1
Female	Total (12+)	25.5	21.0	4.5	32.2	42.1
	12-19	19.4	13.6	E	13.9	65.9
	20-24	34.2	25.5	E	27.5	38.3
	25-34	29.4	24.6	E	29.1	41.5
	35-44	29.7	26.0	E	35.1	34.9
	45-54	27.5	23.9	E	38.1	34.1
	55-64	23.4	20.6	E	43.5	33.1
	65+	12.4	9.2	E	38.7	48.4

* Includes both daily smokers and occasional smokers

Smoking Status in Alberta by Regional Health Authority, 2000/01 (%)[1]

Regional Health Authority	Daily Smoker	Occasional Smoker	Former Smoker	Never Smoked
Chinook RHA	20.8	E°	35.6	38.3
Palliser RHA	23.5	E°	38.6	32.6
Headwaters RHA	22.5	E°	44.9	28.4
Calgary RHA	20.5	4.7	33.0	41.4
RHA #5	23.4	E°	39.0	33.5
David Thompson RHA	23.6	5.8	38.7	31.6
East Central RHA	27.3	E°	35.3	32.1
Westview RHA	23.9	E°	37.7	34.7
Crossroads RHA	25.7	E°	38.4	31.0
Capital RHA	23.3	4.9	34.0	37.3
Aspen RHA	25.2	E°	39.6	31.5
Lakeland RHA	26.5	E°	34.2	34.4
Mistahia RHA	27.6	E°	38.1	30.7
Peace RHA	27.4	E°	40.7	27.5
Keeweetinok Lakes RHA	31.8	E°	34.3	25.6
Northern Lights RHA	28.9	E°	35.2	31.2
Northwestern RHA	21.5	E°	39.3	32.9

"E" – results not reliable due to small numbers

Source: Statistics Canada. Canadian Community Health Survey: Smoking status, by age group and sex, household population aged 12 and over, Canada, provinces, territories, health regions and peer groups 2000/01. Health Indicators, May 2002. Catalogue no. 82-221-XIE

Rows that do not add up to 100% are a result of a smoking status not stated.

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TOBACCO-ATTRIBUTABLE MORTALITY

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Quick Facts

- An estimated three million people die from tobacco-related diseases worldwide each year.
- Researchers estimate that the global death rate will rise to 10 million per year within 30 to 40 years.
- Tobacco causes one in four deaths in developed countries, one in eight deaths in developing countries, and one in six deaths worldwide.
- Smoking is the leading cause of preventable illness, disability and death in Canada.
- Over 45,000 Canadians die each year from tobacco-related diseases.
- It was estimated that approximately 3,400 Albertans die each year from tobacco-related diseases.
- Smoking kills more people in this country than HIV/AIDS, motor vehicle collisions, murder, suicide and illicit drug use combined.
- Half of all regular smokers will eventually be killed by their habit, and most of these deaths are premature.
- Researchers estimate that, on average, smokers lose about 15 years of their lives.
- An estimated 500,000 potential years of life are lost (PYLL) each year in Canada because of smoking, with over 35,500 PYLL in Alberta.
- On average, people who quit smoking before the age of 50 cut their risk of premature death by half.
- Between 1988 and 1997 there were 870 fire-related deaths in Canada and 88 fire-related deaths in Alberta, due to fires caused by smokers' materials.

TOBACCO-ATTRIBUTABLE MORTALITY

One of the numbers most often used to convey the urgency of tobacco reduction is the estimated number of tobacco-related deaths. The millions of lives that tobacco claims each year make tobacco one of the most important public health issues of our time.

Mortality Worldwide

Worldwide, an estimated three million people die from tobacco-related diseases each year.[1]

Tobacco causes[2]

- one in four deaths in developed countries
- one in eight deaths in developing countries
- one in six deaths worldwide

Researchers estimate that, within 30 years, the number of global tobacco-related deaths will rise to 10 million per year, and tobacco will become the single biggest cause of death worldwide.[3]

Mortality in Canada and Alberta

In Canada, over 45,000 people die each year from smoking,[4] ***and an estimated 3,400 of them are Albertans.***[5]

Smoking is the leading cause of preventable illness, disability and death in Canada. In fact, smoking kills more people than HIV/AIDS, motor vehicle collisions, murder, suicide and illicit drug use *combined*.[6] At least 21% of all deaths among Canadians over 35 are tobacco-related.[5]

One fifth of all deaths from the three leading causes of mortality in Canada – cancer, heart disease and stroke – are attributed to cigarette smoking.[7]

Mortality rates in Canada continue to rise.

Mortality rates in Canada continue to rise even though smoking rates have generally dropped. This is because there is a latency period of about 20 to 30 years from the time of regular smoking exposure to the onset of disease. Mortality rates today reflect the smoking behaviour of the 1970s and 1980s.[9] Since 1991, the number of tobacco-related deaths in Canada has increased by an estimated 8% (3,807 deaths). Of these, almost two thirds (64%) occurred in females.[9]

Half of all regular (lifelong) cigarette smokers will eventually die from their habit,[3] and most of these deaths are premature.[3]

Researchers estimate that, on average, smokers lose about 15 years of their lives. Those who die before age 70 (about half) lose an average of 22 years; those who die after age 70 lose an average of eight years.[10] Even at age 35, a smoker's life expectancy is reduced by 10 to 20%.[11]

In Canada alone, almost 500,000 potential years of life are lost (PYLL) each year, with over 35,500 PYLL in Alberta.[12]

PYLL (also referred to as YPLL) stands for "potential years of life lost" and is a calculation of the number of years of life lost due to premature death. PYLL is calculated using mortality estimates and represents the difference between life expectancy and age of death for persons of the same age and gender.

Of course, the risk of tobacco-related premature death is dependent on a number of factors including number of years as a smoker, number of cigarettes per day, and presence or absence of disease upon quitting. The estimates quoted here vary accordingly, but smoking cessation has proven benefits for all smokers, even older smokers and smokers who have a tobacco-related disease.

Mortality from Fire

In Canada, smoking materials are the leading cause of fire deaths. One in five fire deaths in Canada and one in four fire deaths in Alberta are due to fires ignited by smoking materials. Smoking materials are sources of ignition, such as cigarettes, pipes, cigars, matches and lighters, which are used in conjunction with smoking.[13]

Between 1988 and 1997, 652,882 fires were reported in Canada, of which 36,125 were smokers' material-related fires. In total, there were 870 deaths and 4,202 injuries resulting in approximately $433 million in property damage.[13]

Over this 10-year period (1988-1997), there were 70,600 reported fires in Alberta of which 4,841 were attributed to smoker's material-related fires. These fires killed 88 people and injured 626 others resulting in property damages amounting to $56 million.[13]

People who have already been diagnosed with coronary heart disease can reduce their risk of another heart attack by 50% or more by quitting smoking.[13]

Benefits of Quitting

Good news: smokers can reduce the risk of premature death by quitting.

On average, people who quit smoking before the age of 50 cut their risk of premature death by half.[11] Compared to continuing smokers, people who have quit smoking have a reduced risk of heart disease, lung cancer, chronic lung disease and other tobacco-related illnesses.

Just one year after quitting, the excess risk of dying from coronary heart disease is cut by half. And the risk continues to drop after one year, returning to normal after about 15 years. The risk of stroke also returns to the level of a non-smokers' within five to 15 years of cessation.[14]

The risk of lung cancer drops steadily for people who quit smoking – after 10 years, it's cut by about half (30 to 50%).[14] Smoking cessation reduces the risk of other tobacco-related cancers as well, including cancer of the larynx (voice box), oral cavity (mouth and throat), esophagus, pancreas and urinary bladder.[14]

Quitting also significantly reduces the risk of respiratory diseases (chronic obstructive pulmonary disease, influenza, pneumonia and bronchitis) and improves lung function.[15]

Smoking cessation has major and immediate health benefits for all smokers – young and old, sick and well.[15] It is the single most important step that smokers can take to enhance the length and quality of their lives.

Estimating Tobacco-Attributable Mortality (TAM)

How is TAM calculated?

Because estimates for smoking-attributable mortality are so often used in tobacco control, it's useful to understand how those numbers are calculated. Estimates are developed using the Tobacco-Attributable Mortality, Morbidity and Economic Cost method (TAMMEC),[16] and are based upon the following data:

- annual Canadian mortality data for 26 disease categories known to be attributable to smoking
- smoking prevalence rates for the same year (in adults aged 35 and older*)
- relative risk ratios (based on the Cancer Prevention Study II of the American Cancer Society)

What are the latest numbers available?

Most of the estimates available today are based on 1996 data. The estimated number of tobacco-related deaths in 1996 was 45,215.[4] Here's how that number is broken down:

Tobacco-Attributable Mortality, Canada 1996[4]

Adult diseases (Over 35 years of age):

Cancers: lip, oral cavity, pharynx, esophagus, pancreas, larynx, trachea, lung, bronchus, cervix uteri, urinary bladder, other urinary	17,703
Cardiovascular: rheumatic heart disease, hypertension, ischemic heart disease, pulmonary heart disease, other heart disease, cerebrovascular disease, atherosclerosis, aortic aneurysm, other arterial disease	17,562
Respiratory Diseases: respiratory tuberculosis, pneumonia/influenza, bronchitis/emphysema, asthma, chronic airways obstruction	9,498
Pediatric Diseases (less than one year of age): Low birth weight, respiratory distress syndrome, respiratory conditions – newborn, sudden infant death syndrome	105
Passive Smoking Deaths (deaths among non-smokers from lung cancer attributable to passive smoking)	347

* For the purposes of estimating total tobacco-related deaths, it's assumed that no death is caused by smoking in people under the age of 35. In fact, tobacco-related deaths can occur before age 35, but those numbers are small and do not affect overall percentages.

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ADDICTION AND CESSATION

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Quick Facts

- 33% to 50% of people who experiment with cigarettes become regular users.
- 70% to 90% of people who are regular users are addicted to nicotine.
- Studies show that nicotine is as addictive as heroin and cocaine.
- Relapse rates for quitters are high: about 60% relapse in three months, and 75% in six months.
- Withdrawal symptoms include: depression, insomnia, irritability, anxiety, difficulty concentrating, restlessness, decreased heart rate, increased appetite, weight gain and craving for nicotine.
- Withdrawal symptoms peak 24 to 48 hours after cessation and can last from three days to four weeks, although the craving for a cigarette can last for months.
- Many cessation programs are based on the Stages of Change model which recognizes that smokers vary in motivation and readiness to quit.
- Relapse is the rule, not the exception, and must be viewed as part of the process.
- Millions of Canadians have quit: there are now more former smokers (37%) than current smokers (26%), in Canada.

ADDICTION AND CESSATION

It's clear that smoking is addictive: some people continue to use tobacco even when they wish they could stop. But addiction is very complex and highly individual. Not surprisingly, many smokers try to quit. About 50% of Canadians[1] and 45% of Albertans[2] who currently smoke, have tried to quit at some point. What makes smoking and other forms of tobacco so hard to give up? Researchers have recognized for some time that, while the nicotine in tobacco creates a strong physical addiction, psychological and social factors also contribute to the addictive nature of tobacco.

Addiction Rates

Thirty-three percent to 50% of the people who experiment with cigarettes become regular users. And 70% to 90% of people who are regular users are addicted.[3]

Compared to many other addictive substances, the addiction rate for tobacco is remarkably high. Compare it to alcohol, for instance: 77% of Albertans use alcohol, but the addiction rate is estimated to be about 2.7%.[4]

Smoking is so addictive that many people continue to smoke even when their lives are in immediate danger.

Studies have shown that

- 40% of those having their voice box removed (laryngectomy) continued to smoke afterwards.[5]
- 38%[6] to 50%[6] of smokers who have had a heart attack start smoking again while still in hospital, most within 48 hours of coming out of intensive care.
- almost 30% of those surviving surgery for lung cancer start smoking again.[7]

Physical Aspects of Addiction

Smoking is more than a habit. The nicotine in tobacco causes physical addiction. Studies show that nicotine is as addictive as heroin and cocaine.[8]

Like heroin and cocaine, nicotine is considered addictive because

- **It is psychoactive**

  Nicotine is a drug that acts on the brain and affects mood and cognitive function (e.g. it stimulates, it affects concentration).[9]

- **People use it compulsively**

  Most smokers smoke 10 or more cigarettes every day. Very few people are able to have a cigarette every now and then: in Canada, only 4% of smokers are occasional (non-daily) smokers.[9]

- **Nicotine is a "reinforcer"**

  One of the ways that drugs are determined to be addictive is if they reinforce a cycle of drug-taking behaviour. Nicotine is a reinforcer because it causes many smokers to continue smoking in order to avoid the pain of withdrawal symptoms. Smokers also adjust their smoking behaviour (inhaling more deeply, for example) to maintain a particular level of nicotine in the body.[9]

Psychosocial Aspects of Addiction

Psychological and social factors also make smoking highly addictive.

One of the most obvious reasons that smokers continue to smoke is that it gives them pleasure: the pleasure of handling the cigarette, the oral satisfaction of drawing on the cigarette, the comfort of a quick fix in times of boredom, frustration, anger or stress.

If the pleasure of smoking outweighs the pain, smokers will be unmotivated to quit. And, while smokers may experience a daily level of discomfort (having to go outdoors to smoke, smelling like smoke, experiencing smoker's cough, having shortness of breath), the immediate consequences of smoking are not severe. Smokers, unlike some alcoholics or heroin addicts, are not in immediate danger of losing their jobs or families due to their addiction. It becomes easy, then, to put off quitting or to resume smoking after a cessation attempt.

Relapse rates (starting again after quitting) are high. In fact, they are about the same as relapse rates for heroin and alcohol: about 60% of quitters relapse in three months, and 75% in six months.[9] Less than 5% of smokers who quit without the help of programs or therapies maintain continuous abstinence for one year or more.[10]

Factors Influencing Cessation

The high rate of relapse can be discouraging. However, growing research in the physical aspects of addiction and the psychological aspects of behaviour change have helped to increase the smoker's chances of abstinence. The support offered to smokers today is based on an appreciation for the complexity of the cessation process, a process that is influenced by many interrelated factors, including:[5]

- the degree to which the smoker is motivated to quit
- the extent of the smoker's biological and psychological addiction to nicotine
- the smoker's mood or mental state
- the smoker's level of confidence
- the smoker's past experience with cessation
- the smoker's environment (home, work and leisure)
- the influence of family and friends, and day-to-day events

One of the tools that can help smokers and health professionals better understand the process of quitting is the Stages of Change model. This model was developed 20 years ago, but has become widely used in cessation programs in the past few years. Today, many programs use a "staged" approach to intervention.[5,10]

Stages of Change Model

The Stages of Change model has shaped our current understanding of behaviour change. The model recognizes that quitting does not happen in one step and that change is a dynamic process.

According to the Stages of Change model, there are five stages involved in changing addictive behaviour:[15,16,18]

1. Precontemplation

In this first stage, the smoker has no intention of quitting in the next six months. Twenty-two percent of Canadians and 24% of Albertans are in this stage, according to the 2001 Canadian Tobacco Use Monitoring Survey.[18]

2. Contemplation

A smoker in the contemplation stage is aware that a problem exists and is seriously thinking about quitting at some point, but has not yet made a plan to do so. People can remain stuck in this stage for a long time. Eighteen percent of Canadians and 20% of Albertans are in this stage.[18]

3. Preparation

In this stage, the smoker has made a decision to quit within the next 30 days and prepares to do so. Usually this involves mental preparation, but some smokers also try to ready themselves for abstinence by cutting down or by delaying the first cigarette of the day. Eighteen percent of Canadians and Albertans are in this stage.[18]

4. Action

The action stage begins with the first day of abstinence and continues for six months. Two percent of Canadians and 4% Albertans are in this stage.[18]

5. Maintenance

In maintenance, people actively work to prevent relapse and remain non-smokers. Maintenance is a continuation, not an absence, of change. A large proportion of Canadians and Albertans are in this stage: 50 and 44%, respectively.[18]

Most people who successfully quit do not follow a straight path to maintenance.[19]

In fact, most smokers make an average of three or four quit attempts before becoming long-term non-smokers.[15,19] Relapse is the rule rather than the exception and must be viewed as part of the process so that smokers don't become completely demoralized.

Stage-Appropriate Interventions

Understanding the Stages of Change model can help programmers refine their interventions and target smokers at various stages. Below are some examples of appropriate intervention goals for each stage of change (adapted from examples developed by the Ontario Tobacco Strategy's Program, Training and Consultation Centre)[19]

Precontemplation

- Increase the client's perception of the risks associated with smoking.
- Encourage the client to begin considering the pros and cons of smoking.

Contemplation

- Tip the decisional balance in favour of quitting.
- Increase motivation to quit.

Preparation

- Help the client select the best approaches to cessation.
- Help build the client's confidence in his or her ability to achieve abstinence.

Action

- Help the client develop a plan of action (based on level of addiction and experience with previous cessation attempts).
- Support the client in learning cessation techniques and skills.

Maintenance

- Help the client identify and use relapse prevention strategies (substitute behaviours, coping strategies).
- Offer support.

Relapse

- Help the client resume the process of change without becoming demoralized over relapse.

Relapse

Relapse can be an important opportunity for learning. What is viewed by some as failure can be a key part of the cessation process.

If relapse is used constructively it can become an effective tool, preparing the smoker for the next attempt. In fact, studies show that smokers with a quitting history have a better chance of achieving abstinence in the next year or two.[21] The relapsed smoker is in a good position to evaluate available cessation methods and decide what might work the next time.

Cessation Methods

A wide range of cessation methods are available in Alberta to help smokers cope with the physical and psychological symptoms of withdrawal, and to support the process of long-term change.

Smoking cessation methods include self-help programs or products, counselling and formal support programs, drug therapies, and a variety of other, non-drug therapies. Often several methods or techniques are used together to increase the smoker's chances of success.

Studies show that over 90% of smokers use self-help methods to quit rather than an organized program.[22]

"Self-quitters" quit without the support of an organized program, although many use self-help aids that are designed to be used without additional assistance. Information and interactive tools are available to self-quitters via the Internet. Self-help products such as video or audio tapes, pamphlets or booklets, and computer programs are widely available.

Most smokers try to quit "cold turkey," without any cessation aids. This method results in fairly low success rates (about 5%).

Counselling and support are available to smokers in a number of ways and have been proven to increase success rates.

- **Group programs and peer support**

  Many health agencies offer support and education through group programs at minimal or no cost to the smoker. Information and support is also available through various websites and chat groups on the Internet. Studies have shown that long-term maintenance sessions can improve success rates.[23]

- **Individual counselling**

  One-on-one counselling and specialty clinics offer intensive counselling and individual strategies.

- **Counselling by a healthcare professional**

  Studies have shown that cessation advice given by physicians, nurses, pharmacists, dentists, dental hygienists and therapists can help motivate smokers to quit and have a positive effect on cessation rates.[21] A review of studies found that a brief prompt with limited counselling can yield a quit rate of 3% to 13%, while a more intensive intervention that includes follow-up sessions can produce cessation rates between 13 and 40%.[22]

Drug therapies seem particularly promising, especially when used in conjunction with support programs and/or counselling.

Drug therapies include

- **Nicotine replacement therapies** (Nicotine gum such as *Nicorette*®, *Nicorette Plus*®, and Nicotine patches such as *Nicotrol*®, *Nicoderm Patch*® and *Habitrol*®)

  Two forms of nicotine replacement therapies (NRTs) are licensed as over-the-counter medication in Canada: nicotine chewing gum and the nicotine patch. (Two other forms of nicotine replacement therapy, a nasal spray and an inhalator, are now available by prescription in the United States and may be available in Canada in the next few years.) Both the gum and the patch temporarily provide smokers with a lower, more gradual dose of nicotine to help reduce the severity of withdrawal symptoms: with both products, smokers get one-third to one-half of their normal nicotine intake.[3] NRTs are designed to break the smoking cycle, cut exposure to carcinogens and other chemicals in cigarettes, and ease withdrawal. They are used until initial withdrawal symptoms have lessened and until smokers feel more confident in their ability to quit – usually less than three months.[3]

  NRTs have been proven to double the chances of long-term cessation, and success increases when used in combination with well-developed support or behaviour modification programs.[23]

  There are two main drawbacks to using these products:

  Some smokers will continue to experience withdrawal symptoms because NRTs offer slower and lower doses of nicotine than do cigarettes (cigarettes offer high levels of nicotine seven seconds after inhaling).[3]

  About 10% of gum users become dependent on the gum.[23]

- **Nicotine-free pill** (*Zyban*® or bupropion hydrochloride)

  Zyban® is a prescription drug that helps to suppress withdrawal symptoms and reduce the weight gain associated with smoking cessation.[27] Studies show that *Zyban*® doubles the rate of cessation, and combining *Zyban*® with a Nicotine Replacement Therapy may produce even better results.[27]

  Zyban® comes in the form of time-released tablets. Treatment begins one week before the quit date and continues for seven to 12 weeks. Side-effects include dry mouth, headache, insomnia and, in rare cases, seizures.[28]

Alternative, non-drug therapies are popular, although few have been scientifically proven to increase cessation rates.

Non-drug therapies include

- **Hypnosis** Hypnotic therapy seeks to alter smokers' attitudes toward tobacco by offering them suggestions or prompts while they are in a relaxed and focussed (hypnotic) state. Hypnosis can be used either in a group or an individual setting.

  The success rate of hypnosis is unclear: evaluations have produced contradictory results, with cessation rates ranging from 0% to 80%.[27] Hypnosis may be more successful when used with other cessation methods.[28]

- **Acupuncture** Acupuncture is based on the Chinese science of energy pathways in the body. Needles or staple-like attachments are inserted in the skin at strategic points with the theory that this will reduce or eliminate cravings to smoke.

  Recent studies suggest that acupuncture is somewhat more effective than the 5% self-quitter rate. However, acupuncture has been shown to be no more effective than placebo acupuncture (using sham acupuncture points) in helping smokers quit.[29-31]

- **Laser therapy** Laser therapy is based on the same principle as acupuncture, but it uses lasers rather than needles to relieve withdrawal symptoms. This method is new to Canada and there is no scientific evidence to support the high success rates attributed to it.[30-31] In fact, a recent study found no significant difference in cessation rates between a laser treatment group and control groups.[32]

- **Substitution** Some smokers try to substitute herbal or clove cigarettes for their regular brands believing them to be a healthy alternative. Neither is safe however. Herbal cigarettes pose a health risk because they generate carbon monoxide and tar, and because smoke from any plant product can damage the lungs and airways.

The good news is that millions of Canadians have quit. There are now more former smokers (37%) than there are current smokers (26%) in Canada.[33]

Research indicates that many Canadian smokers would like to quit as they are in the precontemplation, contemplation and preparation stages of change.[15] As understanding of tobacco addiction and behaviour change continues to grow, the support for people wanting to quit will continue to evolve so that smokers have a better chance of fighting their addiction.

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Quick Facts

- Tobacco use is considered the single most significant cause of preventable morbidity and mortality in Canada and in most other developed countries.
- Smoking causes lung cancer and cancers of the mouth, pharynx (throat), larynx (voice box) and esophagus.
- Smoking is a contributing cause of cancers of the bladder, kidney, and pancreas.
- 17,700 Canadians die each year from tobacco-related cancers.
- 2,500 individuals in the prairie provinces die each year from tobacco-related cancers.
- Smoking causes respiratory diseases, including chronic obstructive pulmonary disease (COPD).
- 9,500 Canadians die each year from tobacco-related respiratory diseases.
- 1,500 individuals in the prairie provinces die each year from tobacco-related respiratory diseases.
- Smoking causes cardiovascular diseases, including ischemic heart disease, stroke and diseases of the blood vessels.
- 17,500 Canadians die each year from tobacco-related cardiovascular diseases.
- 2,900 individuals in the prairie provinces die each year from tobacco-related cardiovascular diseases.
- Switching to "light" cigarettes does not necessarily lower the risk of tobacco-related disease.
- Light cigarettes can yield levels of tar, nicotine and carbon monoxide that are much higher than the levels recorded on the sides of the cigarette packages.

HEALTH CONSEQUENCES OF SMOKING CIGARETTES, CIGARS AND PIPES

Tobacco use is considered the single most significant cause of preventable morbidity and mortality in Canada and in most other developed countries.[1]

Many adults in Canada know that cigarette smoking is a serious health hazard, and that even occasional smoking is risky.[2] Tobacco smoke contains over 4,000 chemicals. About 50 of them, such as tar, ammonia, carbon monoxide, oxides of nitrogen and benzopyrene can cause, initiate or promote cancer.[3]

Although the amount of chemicals in each cigarette is small, it is cumulative. That is, the amount stored in the body increases with each puff of a cigarette. There are just over 10 puffs per cigarette. In a one year period, at a rate of one pack of cigarettes a day, a smoker will inhale about 73,000 puffs of dangerous chemicals.[3]

Smoking causes cancer, lung disease, heart disease and many other health problems. This section outlines some of the known health effects of smoking.

Cancer

How does cancer attack the lungs?

Cigarette smoke inhibits and damages the normal cleaning process by which the lungs get rid of foreign and harmful particles. Smoke destroys an important cleansing layer in the lungs, which in turn causes a build-up of mucus. The result is "smokers' cough," an alternative way that the lungs use to try to clean themselves. The harmful cancer-producing particles in cigarette smoke are able to remain lodged in the mucus and develop into cancer tumors.[4]

Smoking causes about 17,700 cancer deaths in Canada each year – and about 2,500 of those occur in the prairie provinces.[5]

Researchers have known for almost 50 years that smoking causes cancer. Lung cancer was the first cancer to be linked to smoking and, of all the tobacco-related cancers, has taken the biggest toll.

Following several decades of rapid increase, the rate of lung cancer incidence and mortality rates among young women began to level off in 1993 reflecting a decline in smoking rates among young women that began in the mid-1970s. However, they remain roughly four times as high as rates in 1973 and are only as half as high as the rates among men.[6]

Lung cancer is the number one cause of cancer deaths among men and women both in Alberta[6] and Canada,[6] and worldwide.[7,8]

Lung cancer accounts for almost a third of cancer deaths in men and about one fourth of cancer deaths in women in this country.[6] And most of these deaths are caused by smoking: researchers estimate that 80% to 90% of all lung cancer is tobacco-related.[5]

In 2002, lung cancer accounted for 26.7% of all cancer deaths in men and 24.2% of all cancer deaths in women, in Alberta.[9]

Lung cancer rates in women are rising.

Lung cancer rates follow smoking rates (with a latency period of about 20 to 30 years from regular smoking exposure to onset of cancer). In Canada, smoking rates among women continued to rise until the mid-1970s (whereas smoking among men began dropping off in 1965). For this reason, we are continuing to see an increase in lung cancer incidence and mortality rates among women.[6]

Lung cancer is not the only tobacco-related cancer. At least eight other cancers are linked to smoking.

Smoking is a *major cause* of four other cancers and is a *contributing cause* of at least four more.

Organs that come into direct contact with smoke are at greatest risk for cancer in smokers.[10] In addition to lung cancer, smoking is a major cause of cancers of the

- mouth
- pharynx (throat)
- larynx (voice box)
- esophagus

Nearly 80% of esophageal cancers are attributable to smoking. The disease is more common in men than in women.[10]

Organs and tissues that do not come into direct contact with smoke are also at risk for cancer because the carcinogens (cancer-causing chemicals) are absorbed into the bloodstream and circulate through the organs. Smoking is a contributing cause of cancers of the[11]

- bladder
- kidney
- pancreas

Many other cancers may be related to tobacco use, including stomach, colorectal, liver, and some forms of leukemia. Evidence suggests that smokers are at increased risk for these cancers, but further research is needed to determine whether or not the association is causal.[13]

Respiratory Diseases

Smoking causes pulmonary and respiratory diseases. An estimated 9,500 Canadians and 1,500 individuals in the prairie provinces die of respiratory diseases caused by smoking each year.[5]

Smoking can cause a number of diseases that permanently damage the lungs and airways of smokers. There is no cure for these diseases and no way to reverse the damage.

The respiratory diseases associated with smoking are often grouped together and referred to as chronic obstructive pulmonary disease or COPD. These diseases include[13]

- emphysema
- chronic bronchitis
- asthmatic bronchitis

Symptoms include chronic cough or wheezing, accompanied by trouble breathing. COPD is considered a "silent" killer in that affected persons do not experience significant symptoms until the disease becomes severe. Because of this, many patients do not seek medical attention at a time when smoking cessation might help to stabilize the disease.[15]

Chronic obstructive pulmonary disease (COPD) is one of the leading causes of death in Canada and is mostly preventable.[4]

Smoking is the single most important risk factor for COPD. Smokers are 10 times more likely to die from COPD than non-smokers.[16] Ten percent to 15% of all smokers will develop COPD.[17]

In addition to COPD, smokers are at increased risk for influenza and pneumonia.

Studies show that smokers have a "blunted" or decreased immune response to the influenza vaccination, and that smokers are significantly more likely to die of influenza or pneumonia than non-smokers.[16]

Cardiovascular Diseases

Smoking also causes heart disease, stroke and diseases of the blood vessels. About 17,500 Canadians and 2,900 individuals in the prairie provinces die each year from tobacco-related cardiovascular disease.[5]

Smoking is a major risk factor that contributes to cardiovascular disease, a major cause of death in Canada. Smoking, as well as exposure to secondhand smoke, has an immediate effect on the heart and makes the heart work harder by[21]

- **Decreasing the amount of oxygen that is carried in the blood**

  Carbon monoxide and other gases compromise the amount of oxygen in the blood so that the heart has to work harder to get an adequate supply of oxygen.[21]

- **Increasing the heart rate**

  The nicotine in tobacco causes the heart rate to increase and can elevate blood pressure. The heart beats faster to get more oxygen by pumping a greater volume of oxygen-poor blood.[21]

- **Decreasing the size of blood vessels**

  A buildup of fat deposits associated with nicotine and carbon monoxide makes blood vessels and arteries smaller, which limits the blood supply to the heart.[21]

Over time, smoking can cause severe damage to the heart and arteries, and can lead to

- **Heart attack and sudden death**

  Studies have shown smokers to be at two to four times greater risk for heart attacks and sudden death from coronary heart disease than non-smokers.[17]

  Smokers have a 70% chance of dying from coronary heart disease (CHD). This is the build up of fat deposits in the blood supply system. In fact, smoking more than 40 cigarettes a day increases ones chance of dying by 200% to 300% in comparison to non-smokers.[26]

  Smoking cessation reduces the risk of tobacco-related cardiovascular disease by approximately 50% within one year, and to normal levels (that is, to the levels of people who have never smoked) within five years.[24]

- **Stroke**

  Several major studies have shown that smokers are at increased risk for stroke. The risk is about two times higher than for non-smokers and is dose-dependent (increases with the amount smoked).[27]

  Cigarette smoking is a well-known risk factor that contributes to, and significantly increases, the chances of having a stroke. The risk of stroke is approximately 50% higher in smokers than in non-smokers. The risk increases with the number of cigarettes smoked per day. Smokers who consume more than 25 cigarettes per day have the highest risk of a stroke.[23,28]

- **Peripheral vascular disease**

  Peripheral vascular disease ("poor circulation") is a painful condition in which plaque forms in the arteries of the legs, constricting blood flow. This can cause pain and trouble walking and, in extreme cases, can lead to amputation.[29]

- **Aortic aneurysm**

  An aortic aneurysm is a bulging or ballooning of the wall of the body's largest artery, the aorta. Most aortic aneurysms are asymptomatic (show no symptoms) as they enlarge, and may rupture and cause instant death. Smoking is the risk factor most strongly associated with abdominal aortic aneurysm.[30]

Other Health Problems

Smoking is associated with a number of other health problems.

In addition to cancer and respiratory and cardiovascular diseases, growing evidence links smoking to a number of other health problems, where it may increase the severity or likelihood of occurring. This includes health problems such as

- cataracts[31]
- erectile dysfunction (impotence)[32]
- gastroesophageal reflux disease (symptoms include heartburn and acid regurgitation)[33]
- hoarseness and vocal chord inflammation[33]
- hormone-related problems (including earlier female and male menopause)[34,35]
- increased injuries[36,37,38] (including increased motor vehicle collisions, fire-related injuries,[39] and exercise-related injuries)
- increased severity of rheumatoid arthritis[40,41]
- infertility in men and women[42,43,44,45,46]
- menstrual disorders[47]
- sleeping problems[48]
- thyroid disease[49,50]
- tooth and gum damage[51,52]
- ulcers and bowel disorders (e.g., Crohn's Disease)[53,54]

The probability of erectile dysfunction is increased in those with chronic disease (e.g., heart disease, hypertension, diabetes) who are also smokers. In a recent study, non-smokers with heart disease had a 21% probability of erectile dysfunction, while smokers with heart disease had a 56% probability.[55]

The "Light" Myth

Switching to "light" or "mild" cigarettes does not necessarily lower the risk of tobacco-related disease.[59]

Most smokers believe that light cigarettes are less damaging because they have lower amounts of tar, nicotine and carbon monoxide. But the amounts indicated on the side of the package are misleading. Research has shown that light cigarettes can yield levels of tar, nicotine and carbon monoxide that are much higher than the levels recorded on the sides of the packages.[60] In fact, in some cases, light cigarettes can yield levels that are even higher than some regular cigarettes. Switching to light cigarettes, then, is unlikely to substantially reduce the risk of disease and may in fact increase the risk if smokers smoke more or put off quitting because they believe that light cigarettes are safer.[61]

Tar, nicotine and carbon monoxide values are based on measurements taken by a smoking machine. But researchers have learned that smoking machines do not accurately represent the way that people smoke.

Smoking machines test cigarettes by taking periodic puffs (usually one per minute) and puffing for a specified duration (for example, two seconds). This process is continued until a predetermined butt length is reached.[62] But people are highly individual in their smoking behaviour, and studies show that many people inhale more deeply or more often than a machine.[63]

Smoking machine yields are also lower because light cigarettes have tiny air holes cut into the filter which allow air to enter the filter and dilute the smoke. These holes, however, are often covered up by the smoker's fingers or lips, yielding much higher amounts of toxins.[62]

The way in which a cigarette is smoked is one of the most important factors in determining levels of tar, nicotine and carbon monoxide.[62]

An estimated 40% of Canadians smoke light or mild, 35% smoke regular, and 25% smoke ultra/extra light or extra mild cigarettes. Five percent more women than men smoke the ultra/extra light or extra mild cigarettes. Overall, more Canadian men and women smoke light or mild cigarettes compared to regular or ultra/extra or extra mild cigarettes.[64]

In Alberta, 41% of current smokers smoke light or mild cigarettes, 34% smoke regular, and 24% smoke ultra/extra light or extra mild cigarettes. Eight percent more women smoke ultra/extra light or extra mild cigarettes as compared to males in the province.[64]

Cigars and Pipes

Switching to cigars or pipes is not a safe alternative.

Studies show that smokers who switch from cigarettes to cigars tend to inhale more than cigar smokers who have never smoked cigarettes.[65] Risk for lung cancer, COPD (chronic obstructive pulmonary disease) and coronary heart disease remains high for cigar smokers who inhale.[66]

All cigar and pipe smokers, even those who don't inhale, are at increased risk for oral cancer and cancer of the larynx and esophagus.[66]

Cancer of the oral cavity includes cancers of the lip, tongue, cheek, gums, roof and floor of the mouth, and larynx (voice box). The risk for these cancers is as high for daily cigar smokers as it is for cigarette smokers. Even the risk of lung cancer among cigar smokers who don't inhale is double that of a non-smoker's.[66]

Smoking and the Workplace

While most tobacco-related and workplace studies have looked at the health effects of active smokers, it has been shown that tobacco smoke can interact with other materials and chemicals in the workplace.[67,68]

Cigarette smoke can

- transform existing chemicals into more harmful ones
- increase exposure to existing toxic chemicals
- add to the biological effects caused by certain chemicals
- interact synergistically with existing chemicals (the effects will be more than the sum of the effects from the exposure to each chemical or material alone – this is also known as the multiplicative effect)

The synergistic effects of tobacco smoke with other workplace hazards are well known. For example, chronic bronchitis is associated with occupational exposure to coal, grain, silica, pollutants in welding environments and, to a lesser degree, sulphur dioxide and cement. Among exposed smokers, the rate of bronchitis is higher than that from smoking alone. Asbestos exposure increases the risk of lung cancer in smokers. Furthermore, there is evidence that the interactive effects of tobacco smoke and workplace pollutants contribute to lung cancer among coke oven workers and gas workers; to pancreatic cancer in refinery workers; and to bladder cancer in groups such as janitors

and cleaners, mechanics, mining machine operators, printing machine operators and workers in the metal mining industry. Rubber workers face an increased risk of pulmonary disability when exposed to occupational particulates and smoking combined. Compared with their non-smoking co-workers, cotton textile workers who smoke have an increased prevalence and severity of bronchitis.[67,68]

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HEALTH CONSEQUENCES OF SPIT TOBACCO

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Quick Facts

- Spit tobacco is not a safe alternative to cigarettes and should not be used to quit smoking.
- Spit tobacco contains more nicotine than cigarettes.
- Spit tobacco causes oral cancer. About half of all oral cancer victims die within five years of diagnosis.
- Long-term moist snuff users increase their risk of cancer of the cheek and gum by up to 50 times.
- Spit tobacco increases the risk of cancers of the pharynx (throat), larynx (voice box), and esophagus.
- Spit tobacco use causes leukoplakia (mouth sores that can become cancerous), tooth abrasion, and gum recession.
- Spit tobacco affects the cardiovascular system and may be associated with heart disease, stroke and high blood pressure.
- Many people start using spit tobacco at a very young age (approximately nine or 10 years old).

HEALTH CONSEQUENCES OF SPIT TOBACCO

The use of spit tobacco is increasing in North America,[1,2] and is more prevalent in the prairies than in the rest of Canada. Both Alberta (1.4%) and Saskatchewan (2.0%) have considerably higher prevalence rates of spit tobacco use than any other province (all other provinces are at about 0.5%).[3] These 1999 statistics are reflective of current statistics given that the prevalence rates are relatively low. Studies show that spit tobacco use is higher among pocketed groups – athletes, Aboriginals, rural males[4,5] – and that initiation starts early, usually around age nine or 10.[6,7]

The 1994 Youth Smoking Survey, a national survey, determined that 8% of Canadian youth (aged 10-19) had tried chewing tobacco or moist snuff, and 3% had tried dry snuff, at some point in their lives.[8]

In Alberta, those 1994 numbers were much higher: 20% of the Alberta teens surveyed had tried chewing tobacco or moist snuff, and 7% had tried dry snuff.[8]

The rise in prevalence and the early initiation of spit tobacco use are especially troubling in light of the serious health consequences of spit tobacco use. Spit tobacco is not a safe alternative to cigarettes.

Spit tobacco comes in two basic forms: chewing tobacco and snuff.

Chewing tobacco is a leafy tobacco sold in pouches or plug tobacco, which is in a brick form. As the name suggests, it is chewed. Users chew the tobacco for several hours to get a continuous high from the nicotine in the tobacco.

Snuff is finely ground tobacco in a powder form that is sold in small tins. Dry snuff can be inhaled, but the more common form is moist snuff which is held between the cheek and gum. Just a pinch of snuff is all that is needed to release the nicotine, which is quickly absorbed into the blood stream.

Addiction

Both chewing tobacco and snuff are addictive because both contain nicotine. In fact, chew and snuff contain much more nicotine than cigarettes do.[10]

Most cigarettes have an average of 8.4 mg of nicotine per cigarette. But one dose of moist snuff has an average of 14.5 mg of nicotine, and one dose of chewing tobacco can have as much as 133 mg of nicotine.[10]

People who are addicted to spit tobacco often use it for many years – and this can lead to very serious health problems.

Health Effects of Spit Tobacco

Spit tobacco is not a safe alternative to cigarettes.

However, with over 3,000 chemicals,[11] including about 28 known carcinogens,[11] spit tobacco is not a safe substitute for cigarettes. The most harmful carcinogens in spit tobacco are the tobacco-specific nitrosamines (TSNAs). They are formed during the curing, fermenting and aging process of tobacco production. Other cancer-causing substances in spit tobacco include formaldehyde, acetaldehyde, arsenic, nickel, cadmium and benzopyrene.[11]

A number of serious health problems can result as a consequence of using spit tobacco. These include[10,11,12]:

- cancer of the mouth (including the lip, tongue, cheek and floor and roof of mouth) and throat
- leukoplakia – a white, leathery, pre-cancerous patch that may develop where tobacco is held in the mouth, such as the cheeks, gums or tongue, and may become cancerous
- increased heart rate and blood pressure and sometimes irregular heart beats
- constricted blood vessels (caused by the nicotine), which can slow your reaction in time and cause dizziness – not a good idea if you play sports or are working in a dangerous environment
- gum and tooth disease, including cavities, lost teeth and painful sores
- gum recession (where the gum pulls away from the teeth), loss of bone in the jaw, tooth abrasion (worn spots on the teeth), yellowing of teeth and chronic bad breath

Cancer

Spit tobacco causes oral cancer, and increases the risk of cancers of the pharynx, larynx and esophagus.[11]

Oral cancer includes cancers of the lip, tongue, cheek, throat, gums, roof and floor of mouth, and voice box (larynx). Surgery to treat oral cancer is often extensive and disfiguring and may involve removing parts of the face, tongue, cheek or lip. Oral cancer, like lung cancer, is associated with low survival rates. On average, half of all oral cancer victims die within five years of diagnosis.[11]

The risk for cancer is strongest at the site of tobacco exposure. Long-term snuff users increase their risk of cancer of the cheek and gum up to 50 times more than those who do not use snuff. This is because moist snuff users hold the tobacco between their cheek and gum.[13]

Oral Damage

Spit tobacco also causes leukoplakia, tooth abrasion and gum recession.[13]

Spit tobacco causes a lot of damage to the inside of the mouth. Users can develop mouth sores (called leukoplakia) that can become cancerous. As well, the grit and sand in spit tobacco products can scratch the teeth and wear away tooth enamel. A user's gums can also recede, especially in the spot where the tobacco is usually placed. The injured gums pull away from the teeth, exposing root surfaces and leaving teeth sensitive to heat and cold. This kind of damage is permanent.[13]

Cardiovascular Diseases

Spit tobacco affects the cardiovascular system and may be associated with heart disease, stroke and high blood pressure.[10]

Like cigarettes, spit tobacco contains nicotine – and nicotine affects the heart. It's not surprising then that studies have found that spit tobacco may put users at increased risk for[10]

- coronary and peripheral vascular disease (heart disease and diseases of the arteries and veins)
- stroke
- high blood pressure (hypertension)

Most people start using spit tobacco at a very young age, putting them at increased risk for premature death.

A 1992 Calgary study found that the average age of initiation for spit tobacco was just over nine years old.[6] This early initiation age means that there is opportunity for sustained exposure. So people who start to use spit tobacco when they are nine will have had over 20 years of exposure by the time they are 30, and over 30 years by the time they are 40. Given the strong risk factor for cancer and the relationship between the onset of cancer and duration of tobacco use, early initiation is a serious public health issue.[7]

Spit Tobacco Cessation

Several US studies report that over 50% of spit tobacco users would like to quit.[17] Therapies and programs for spit cessation have generally been adapted from successful smoking cessation methods; however, some of the challenges that spit tobacco cessation poses are unique and should be considered in any quit attempt. Some of these challenges are[17]

- the presence of oral lesions which can be irritated by nicotine gum (estimates suggest that over 50% of users have some level of oral lesion)
- a strong need for an oral substitute during withdrawal
- the perception that spit tobacco is a safe alternative to cigarettes (users sometimes have less motivation to quit as a result)
- difficulty fading nicotine because dosages are individual in amount and length of delivery (fading is the process of systematically reducing nicotine intake in a gradual and controlled way)
- dual addictions – two levels of intervention may be necessary as many spit tobacco users are smokers as well

Research in the area of spit tobacco cessation is limited, but seems to suggest that a combination of therapies offers the greatest hope for success. Often a drug therapy (either Nicotine Replacement Therapy or Zyban®) is used in combination with some form of behaviour modification counselling or support.[18] The Nicotine Replacement Therapy or Zyban® helps to ease withdrawal symptoms (which are similar to those of smokers), and counselling helps to identify triggers and develop effective coping strategies. Users are taught to substitute safe oral substances such as non-nicotine mint or herbal snuff, pumpkin or sunflower seeds, or chewing gum.[1]

Studies also show that spit tobacco prevalence is considerably higher among particular groups, such as athletes, Aboriginals and rodeo fans, and that motivation and cessation programs should be targeted to these populations to ensure greater success.[1]

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Quick Facts

- ETS (or secondhand smoke) contains 50 cancer-causing chemicals, and these are inhaled and absorbed by non-smokers.
- Traces of carcinogens and other toxins are found in the blood, urine, saliva and breast milk of non-smokers, even after limited exposure.
- Prolonged ETS exposure can cause lung cancer in non-smoking adults.
- About 347 non-smokers die each year in Canada from ETS-related lung cancer.
- ETS causes ischemic (coronary) heart disease in non-smokers.
- Adult non-smokers living with smokers increase their risk of heart disease by about 25%.
- About 3,470 non-smokers die each year in Canada from ETS-related heart disease.
- One in five Canadians has a pre-existing health condition that can be aggravated by exposure to ETS.
- ETS causes diseases of the lower respiratory tract, respiratory irritation, middle ear disease and worsened asthma in children.
- 39% of Canadians live in a home where one or more persons smoke regularly, and 67% work in an environment where smoking is allowed.
- 19% of Alberta children under the age of 12, and 27% of Alberta youth between 12 and 17 years are regularly exposed to ETS in their home.

ENVIRONMENTAL TOBACCO SMOKE (ETS)

Environmental tobacco smoke (ETS), also referred to as secondhand smoke or passive smoking, is an important issue in tobacco control. This section explores the basics of ETS: what it is and why it is a public health problem for Albertans and other Canadians.

Components of ETS

ETS is made up of the smoke that comes from the end of a cigarette, pipe or cigar (called sidestream smoke) and the smoke that is exhaled from the smoker (called mainstream smoke).

Sidestream smoke makes up most of ETS – about 85%, in fact. Scientists have determined that sidestream smoke has more carcinogens (cancer-causing agents) than mainstream smoke and that it causes more skin tumours on mice than mainstream smoke.[1] (Mouse skin studies are commonly used in this field to determine cancer-causing potential.)

ETS contains 50 cancer-causing chemicals.

In 1992, the US Environmental Protection Agency declared ETS a Class A carcinogen (which means that ETS causes cancer in humans). The study concluded that 50 of the 4,000 chemicals in ETS are known to cause cancer. Some of the carcinogens in ETS have no known safe level of exposure.[2]

These chemicals are known to be inhaled and absorbed by non-smokers.

Two-thirds of the smoke from a burning cigarette is not inhaled by the smoker but enter into the surrounding environment.[3]

Secondhand smoke has twice as much nicotine and tar as the smoke that smokers inhale. It also has five times the carbon monoxide which decreases the amount of oxygen in our blood.[3]

Research has shown that non-smokers absorb some of the toxic chemicals and carcinogens from ETS. Researchers have found traces of these toxins in the blood, urine, saliva and breast milk of non-smokers, even after limited exposure.[3]

Exposure to Secondhand Smoke

The 2000/01 Canadian Community Health Survey (CCHS) showed the prevalence by health region of exposure to secondhand smoke. The following table provides the results for Alberta.[7]

Exposure to Secondhand Smoke (ETS), aged 12 and over (%)[7]

Regional Health Authority	Exposure to Secondhand Smoke in the Last Month	No Exposure to Secondhand Smoke in the Last Month
Chinook RHA	29.0	70.5
Palliser RHA	36.3	63.3
Headwaters RHA	25.4	74.5
Calgary RHA	28.2	71.4
RHA #5	29.9	70.1
David Thompson RHA	27.5	72.5
East Central RHA	28.4	71.4
Westview RHA	31.8	68.2
Crossroads RHA	31.9	67.3
Capital RHA	29.5	70.5
Aspen RHA	30.9	68.8
Lakeland RHA	35.6	64.4
Mistahia RHA	30.8	69.2
Peace RHA	36.4	63.3
Keeweetinok Lakes RHA	48.8	50.4
Northern Lights RHA	41.0	57.7
Northwestern RHA	36.2	63.5
Alberta	29.7	70.0

Rows that do not add up to 100% are a result of an exposure to secondhand smoke not stated.

Source: Statistics Canada. Canadian Community Health Survey: Exposure to secondhand smoke (ETS) by sex, non-smoking population aged 12 and over, smokers and former smokers, Canada, provinces, territories, health regions and peer groups 2000/01. Statistics Canada, Health Indicators, May 2002. Catalogue no. 82-221-XIE. 2002.

People who are regularly exposed to ETS are at increased risk for developing health problems related to ETS.

The chemicals that are inhaled from ETS are not safe for humans. It's not surprising then that they can cause serious health problems or make existing health problems even worse.

ETS is a problem for Albertans and Canadians, especially at home and at work.

Urban Canadians spend about 90% of their time indoors, mostly at home or at work.

The 2000/01 Canadian Community Health Survey (CCHS) found that 30% of Albertans and 28% of Canadians said they are regularly exposed to secondhand smoke. Most Albertans (78%) said they are exposed to secondhand smoke when in public places such as restaurants, bars, shopping malls, arenas, bingo halls and bowling alleys. Others also identified exposure to secondhand smoke in a car or other private vehicle (40%) and at home (36%).[7]

ETS and Lung Cancer

ETS can cause fatal lung cancer in adult non-smokers.

Knowing that the cancer-causing agents in ETS are absorbed by non-smokers, and that there is no known safe level of exposure to these chemicals, we might expect ETS to cause cancer in non-smokers. And, indeed, studies have shown that prolonged ETS exposure during adulthood can lead to an increased risk of lung cancer. In Canada, an estimated 347 non-smokers die of ETS-related lung cancer each year.[8]

How do researchers know these chemicals aren't from another source? The carcinogens they have found are specific to tobacco – they could not have come from anywhere else. In addition, cotinine, a metabolite of nicotine, is found in the secretions of non-smokers.

Most Canadians know that ETS causes health problems in non-smokers; in a national survey, 70% of current smokers and 88% of non-smokers said that they believe there is a link between ETS and health problems in non-smokers.

Not surprisingly, pets are at increased risk for ETS-related cancers too. Recent studies show an increased risk for lung cancer in short-nosed dogs,[9] and an increased risk for nasal cancer in long-nosed dogs.[10]

Understanding ETS and Lung Cancer

The World Health Organization study

Over 70% of Canadians believe that ETS can cause lung cancer in non-smokers.[13] However, recently there has been some confusion over this link, largely due to the misrepresentation of a large ETS study conducted by the World Health Organization (WHO). The media reported that the WHO study found no association and that it was suppressing this information. In a press release entitled *Passive Smoking Does Cause Lung Cancer, Do Not Let Them Fool You*, WHO stated that the study did indeed establish an association, and that it found an estimated 16% increased risk of lung cancer among non-smoking spouses of smokers, and a 17% increased risk for workplace exposure. The results of the study, WHO stated, were

> consistent with the results of major scientific reviews of this question published during 1997 by the government of Australia, the US Environmental Protection Agency and the State of California. From these and other previous reviews of the scientific evidence emerges a clear global scientific consensus – passive smoking does cause lung cancer and other diseases.[14]

The study has since been published in a peer-reviewed journal.[15]

Building the evidence

Support for the association between ETS and lung cancer in non-smokers is strengthened by the fact that it is based on several different kinds of evidence, including epidemiological, biological, dose-response and indirect estimates.[16] The following factors have been used to build the association:[17]

- findings from over 15 years of international epidemiological studies have found an increased risk of lung cancer among lifelong non-smokers living with long-term smokers.
- biological studies have confirmed that non-smokers inhale and metabolize the same carcinogens in tobacco smoke that cause lung cancer in active smokers, and that measures of tobacco smoke inhalation and known carcinogens are elevated in passive smokers.
- studies have shown a dose-response relationship, indicating that the greater the amount and length of ETS exposure, the greater the associated risk.
- calculations of increased risk in non-smokers based on extrapolations from the known risk in smokers are in keeping with findings from epidemiological and biological studies.

Further evidence has recently been brought forward by the International Agency for Research on Cancer (IARC) with a scientific working group of 29 experts. This panel concluded in June of 2002, that *secondhand smoke is carcinogenic to humans.*[18]

ETS and Heart Disease

ETS can cause ischemic (coronary) heart disease in non-smokers.

There is increasing evidence that exposure to environmental tobacco smoke (ETS) is associated with an increased risk of coronary heart disease (CHD) in non-smokers. This suggests that ETS is an important and avoidable cause of ischemic (coronary) heart disease.[19]

Estimating the number of deaths that are associated with ETS is a complex task, since there are multiple settings of potential exposure including the home, workplace and public places. However, estimates can be made based on what we know about the exposure levels in specific environments, allowing us to highlight the disease burden from ETS.

It is estimated that ETS causes 10 times as many deaths from heart and blood vessel diseases as it does from lung cancer.[20]

It was estimated that in 1997, 803 Canadians (56 from Alberta) died from coronary heart disease as a result of involuntary tobacco smoke exposure in their homes. This estimate is based on exposure in the home only and excludes workplace exposure.[19]

Tobacco smoke is a potentially deadly environmental exposure. To provide some perspective on the degree of complacency with which ETS is often treated, let's consider one example. Within workplaces, environmental exposure limits for specific toxins are often set to reflect the number of deaths that would likely occur as a result of exposure to the toxin.[19] These environmental limits are usually in the range of one death in 100,000 or one in a million. However, excess coronary heart disease deaths attributed to passive smoking are about four in 100,000 for Canada as a whole. This rate far exceeds what is acceptable for other toxic exposures in the workplace.[19]

Understanding ETS and Heart Disease

Many people are still unaware of the effects that ETS has on the heart and blood vessels, even though ETS causes 10 times more deaths from ischemic heart disease than from lung cancer.[20]

Perhaps public knowledge is low because these findings are still relatively new. In 1986, the Surgeon General's Report concluded that ETS may be associated with cardiovascular disease, but the evidence was not conclusive. Since that time, however, many major epidemiological studies have confirmed the association: ETS is an important and preventable cause of heart disease.

ETS contains at least five times more carbon monoxide than mainstream smoke, and carbon monoxide has immediate negative effects on the heart. So, while ETS causes lung cancer only after long and consistent exposure, ETS can affect the heart within 20 minutes of exposure.

Within 20 minutes to eight hours of exposure, ETS

- increases the resting heart rate, blood pressure and blood carboxyhemoglobin (the compound formed by carbon monoxide and blood hemoglobin that causes carbon monoxide poisoning)[20]
- increases the heart's need for oxygen while compromising its supply and decreasing its ability to process it efficiently[20]
- can worsen the symptoms of angina in people with existing heart disease[20]

With prolonged exposure, ETS

- increases the risk of coronary thrombosis (blood clots) and heart attack[26]
- may cause hardening, clogging and obstruction of arteries[20]
- increases the risk of death from heart disease by about 25% (this association is noted in non-smoking adults who live with smokers)[21]

ETS and Other Health Problems

ETS can make existing health problems worse.

ETS is a health hazard, not only for people who live with it day to day, but also for people who are exposed to it only occasionally (for instance, in restaurants or bars) and for short periods of time.

ETS can affect a non-smoker's lungs, throat and eyes.

ETS affects the respiratory health of non-smokers and can cause reduced lung function, increased coughing, phlegm production and chest discomfort.[2] It can also cause eye irritation, sore throat and nausea in non-smokers.

ETS and Children

Children are particularly vulnerable to ETS because their lungs are still growing and developing.

Children also breathe at a quicker rate than adults, taking in more air (relative to their body weight), and therefore more pollutants, than adults.[27] In the 1992 landmark report by the Royal College of Physicians in Britain, it was reported that children of smoking parents inhale the same amount of nicotine as if they themselves smoked 60-150 cigarettes a year.[28]

In 2000, 25% of the 2.4 million Canadian households with children under the age of 12 reported regular exposure of these children to Environmental Tobacco Smoke (ETS) in the home from cigarettes, cigars or pipes.[29] This is an improvement from 1996-97, when there were smokers in 33% of such homes. Nevertheless, this means that approximately 900,000 children under the age of 12 continue to be regularly exposed to ETS while in the home. Considering that an additional 760,000 children between the ages of 12 and 17 were also regularly exposed to tobacco smoke while in the home in 2000, this means that over 1.6 million children under the age of 18 have increased risks for health and of taking up smoking.[29] In 2001 19% of Canadian children under the age of twelve were regularly exposed to ETS in their home and 27% of those between the ages of 12 and 17.[30]

In Alberta, 19% of children under the age of 12 and 27% of youth aged 12 to 17 years old were regularly exposed to ETS in their home in 2001.[30] British Columbia had the lowest percentage of children aged 12 to 17 exposed to ETS in their home at 18%, and Quebec had the highest at 36%.[30]

The number of cigarettes smoked indoors is a major determinant of the level of risk to a child's health. In those homes with children under the age of 12 where smoking occurs, 47% reported a daily indoor consumption of one to 10 cigarettes; 25% reported a daily consumption of more than 21 cigarettes. Where secondhand smoke exposure was reported, children under the age of 12 were exposed to slightly more than 12 cigarettes per day, on average.[29]

The number of smokers who smoke indoors also influences the level of health risk from ETS exposure at home. In about half of homes with young children (children under the age of 12) exposed to tobacco smoke, only one person smoked regularly indoors. However, over a third (34%) of homes with young children exposed to tobacco smoke had two indoor smokers, and 10% had three or more smokers.[29]

Of those homes where smoking was permitted, about half of them (47%) reported a variety of restrictions intended to limit children's exposure to ETS. However, the other half (53%) reported no restrictions whatsoever.[29]

Children who are exposed to ETS in the house and/or car can develop diseases of the lower respiratory tract such as bronchitis and pneumonia.[31,32,33]

Young children of parents who smoke are twice as likely to suffer from serious respiratory infection requiring hospitalization.[31] Fifteen percent to 23% of hospitalizations for lower respiratory illnesses in young children are due to ETS exposure. Each year in Canada, an estimated 13-20 children die from lower respiratory infections.[33]

ETS also causes other respiratory conditions, including coughs, colds, tonsillitis and adenoid problems.[2] Approximately 16% of all physician visits for coughs, 24% of all tonsillectomies and adenoidectomies, and 20% of all lung infections in children under the age of five are attributable to ETS.[33] Each year in Canada, this amounts to about

- 43,600 cases of bronchitis
- 19,000 cases of pneumonia
- 200,000 physician visits for coughs
- 2,100 tonsillectomies/adenoidectomies[33]

ETS can cause middle ear disease (including acute otitis media) in children.[2]

Commonly known as fluid in the middle ear, middle ear disease affects up to 46% of children by the age of three years.[36] It is the most common reason for surgery in young children, resulting in 16,500 tympanostomies (ear tube operations) in Canada each year. ETS is estimated to be responsible for as many as 13% of all cases of middle ear disease in preschoolers in Canada, or about 220,000 cases each year.[35]

ETS makes existing asthma worse and may contribute to the onset of asthma.[2,37]

Symptoms of asthma are twice as common in the children of smokers.[25] In Canada about 52,000 visits to the doctor for aggravated asthma in children are caused by ETS.[35] Between 8% and 13% of all new cases of asthma are now thought to be caused by ETS.[35]

Infants who were regularly exposed to ETS before birth are at increased risk of sudden infant death syndrome.[38]

The risk of sudden infant death syndrome (SIDS) is two to three times higher when a woman smokes during pregnancy.[38]

Infants are also at increased risk for SIDS if other people in the household smoke – even if the mother is a non-smoker.[38]

A recent national survey showed that 19% of Canadian children under the age of 12 are regularly exposed to ETS in their homes.[40]

Many children are also exposed to ETS in the family car. About half of the smokers in a 1995 survey reported that they smoke in the car when children are present.[41]

ETS is a harmful indoor air pollutant and has serious health consequences, not only for children, who are limited in their ability to remove themselves from the problem, but for adults as well. Since even short exposure negatively affects the human body, reducing indoor ETS is essential to public health.

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SMOKING AND PREGNANCY

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Quick Facts

- About three in ten (32%) of women in Alberta smoked during their last pregnancy, according to the 2000/01 Canadian Community Health Survey (CCHS).
- Women who smoke are much more likely to have a low birth weight baby.
- Low birth weight can result in severe health problems and neonatal death.
- Maternal smoking also increases the risks of miscarriage, stillbirth and death of the newborn within the first few weeks of life.
- From year to year, 35% of women in Alberta who had a stillbirth or neonatal loss smoked throughout their pregnancy.
- Maternal smoking doubles, and possibly triples, the risk of Sudden Infant Death Syndrome (SIDS).
- In Alberta, SIDS is 1.4 to 4.4 times more likely to occur with maternal smoking during pregnancy.
- Consistent exposure to ETS (Environmental Tobacco Smoke) at home or at work also increases the risk of SIDS – even if the mother is a non-smoker.
- Growing evidence suggests that maternal smoking during pregnancy may be associated with deficits in intellectual ability and behavioural problems in children.

SMOKING AND PREGNANCY

The risks of smoking during pregnancy have been well established for many years. Smoking has significant health risks to the mother and fetus. Among women the risks include reduced fertility and miscarriage. The risks to the fetus include low birth weight, stillbirth and sudden infant death syndrome (SIDS). **Despite this knowledge of risks, the 2000/01 Canadian Community Health Survey found that 30% of women in Canada and 32% in Alberta smoked during their last pregnancy.**[1]

Maternal smoking in pregnancy increases the risk of low birth weight, miscarriage and sudden infant death syndrome (SIDS). It is also associated with childhood problems such as reduced lung function increased risk of respiratory illness in early infancy,[2] and middle ear disease in childhood.[3] In each case, a dose-response relationship has been observed (higher levels of tobacco use are associated with higher levels of risk). So cutting down on smoking during pregnancy can help, but no amount of smoking during pregnancy is risk-free.[4]

The harmful chemicals in tobacco smoke pass through the placenta to the fetus.

Nicotine, carbon monoxide and carcinogens (cancer-causing chemicals) are all found at increased levels in the fetuses of smoking mothers or non-smoking mothers who are exposed to environmental tobacco smoke (ETS).[4,5]

Because the harmful compounds in tobacco pass through the placenta, maternal smoking (or maternal use of spit tobacco) creates serious health problems for infants both before and after birth, and can even result in death. Babies born to smoking mothers are up to 35 times more likely to die in infancy than those born to non-smokers.[6]

Twenty-six percent of Alberta women who gave birth to a live infant between 1997 and 1999 smoked at some point during pregnancy. Of these, 89% smoked throughout the pregnancy, and 11% quit during pregnancy.[7]

The relationship between maternal smoking and childhood mortality in Alberta has also been reported by Alberta Health and Wellness at 3.9 per 1,000 among non-smokers compared to 13.0 per 1,000 for heavy smokers and 11.1 per 1,000 for light smokers.[7] Thus, smoking during pregnancy has a significant impact on childhood mortality.

This report also found that mothers who smoke tend to be younger than non-smoking mothers. The average maternal age for smokers is 26 years compared to the average for non-smoking mothers at 29 years.[7]

Low Birth Weight and Premature Delivery

Babies born to smokers are smaller than babies born to non-smokers. Low birth weight can result in severe health problems and neonatal death.

The birth weight of a baby is dependent on two factors: the gestational age of the fetus at the time of delivery (whether the baby is premature or full term) and the growth rate up until delivery. Nicotine has been shown to affect both of these factors, often resulting in low birth weight babies (less than 2,500 grams or 5.5 pounds).[4] The average birth weight for babies in Alberta born to smokers was 3,241 grams, compared to 3,424 grams for babies born to non-smokers, a difference of 183 grams. The low birth weight rate for smokers was 9.7 (per 100 live births); the rate for non-smokers was 5.4.[7]

Smokers were more likely to give birth to a premature infant than were non-smokers. The premature rate for smokers in Alberta in 1999 was 9.9 (per 100 births), while the rate was 7.4 for non-smokers.[7] The majority of premature infants (those born before 37 weeks gestation) are low birth weight.

Low birth weight is much more serious than it sounds. A 1998 report from Ontario identified a relative risk of 2.04 for slow fetal growth/low birth weight when women smoked during pregnancy. In other words, a woman who smoked during pregnancy was twice as likely to have a child born with low birth weight.[9] Babies born with a low birth weight account for about 75% of all deaths in the first week of life. Low birth weight babies are at increased risk for various disabilities, including growth and development problems, delayed speech, cerebral palsy, visual and hearing difficulties, learning disabilities and respiratory problems.[10] An estimated 11% to 21% of all low birth weight births are tobacco-related.[11]

If a woman quits smoking during pregnancy, there is an increase in birth weight. However, these newborns still lag behind those whose mothers did not smoke at all during pregnancy.[7]

Recent findings show that maternal smoking is not the only problem; non-smoking mothers who are consistently exposed to ETS (Environmental Tobacco Smoke) are also at increased risk for having low birth weight babies.[12]

Miscarriage

Maternal smoking increases the risk of miscarriages.

The association between smoking and miscarriages has been established in scientific studies for more than 20 years, and the results have been fairly consistent: the risk of miscarriage in smokers in the first 20 weeks of pregnancy is 33% higher than in non-smokers.[10]

Smokers also have a harder time getting pregnant because smoking lowers a woman's fertility rate.[4]

The effects of smoking on both miscarriage and fertility are dose-dependent and, ultimately, reversible: former smokers do not have increased rates of miscarriage,[10] or lower fertility rates.[4]

Stillbirth

Maternal smoking increases the risk of stillbirth.

The risk of stillbirth and death within the first few weeks of life is higher in babies of smokers.[15] The risk is partly due to the increased risk of premature birth and/or low birth weight. Both of these are associated with neonatal death. Premature labour is twice as common in pregnant smokers.[15]

The other factor that increases the risk of stillbirth or miscarriage is that smokers have a higher risk of having placental problems, including placenta abruption (premature separation of the placenta from the wall of the uterus) and placenta previa (low-lying placenta).[3]

Sudden Infant Death Syndrome (SIDS)

Maternal smoking increases the risk of sudden infant death syndrome (SIDS or crib death).

Substantial literature exists on the positive relationship between smoking and sudden infant death syndrome.[3]

The most dramatic effect of maternal smoking is on the risk of sudden infant death syndrome. SIDS is the most common cause of death in babies between the second week and first year of life. Smoking doubles the risk of SIDS.[16] This is supported by a 1998 report from Ontario indicating a relative risk of 2.44 for SIDS with women who smoked during pregnancy.[5] It's estimated that more than one-third of all SIDS deaths are due to maternal tobacco use.[5]

Women in Alberta who smoke during pregnancy are 1.4 to 4.4 times more likely to have a baby that develops SIDS.[7] Exposure to environmental smoke (ETS) after birth is also associated with increased incidence of SIDS.[16]

Developmental and Behavioural Problems in Children

Growing evidence suggests that maternal smoking during pregnancy may be associated with deficits in intellectual ability and behavioural problems in children.

Maternal smoking during pregnancy has been assessed as a risk factor for a variety of behavioural and neurodevelopmental problems in children. These include reduced general intellectual ability, problems with language and auditory tasks, lower academic achievement, and behavioural problems such as hyperactivity and decreased attention span.[17,19,20] Specific tobacco-related symptoms emerging from the most recent research include increased risk for[17, 18, 19, 20, 21, 22]

- lower school performance
- reduced cognitive abilities
- reduced fine motor skills
- disruptive behaviour
- negativity
- depression
- anxiety
- externalizing behavioural problems
- conduct disorder (older children)
- alcohol abuse (older children)
- substance abuse (older children)

It is difficult to establish definitive causal relationships in an area as complex as behavioural and neurodevelopmental problems. However, this relatively new area of study is receiving a lot of attention, and evidence is mounting.

As research continues in the area of smoking and reproductive health, we will begin to more fully understand the full range of effects that smoking might have on the unborn baby. Until then, the known problems associated with smoking during pregnancy are severe enough to make this a very important area of focus for tobacco reduction.

Other Factors

Male fertility is also affected by smoking.[23,24,25] Men who smoke have fewer sperm, and their sperm moves less efficiently. A 1996 meta-analysis showed that cigarette smoking is associated with modest reductions in semen quality including sperm concentration, motility and morphology.[26]

Placenta abnormalities are fairly common in women who smoke during pregnancy.[27] One study found that mothers who stopped smoking had only half as many fetal and neonatal deaths due to placenta abruption and one-third fewer losses to placenta previa than mothers who continued to smoke.[28]

Smoking and Pregnancy: The Alberta Picture

The 2000/01 Canadian Community Health Survey (CCHS) found that 32% of Alberta women smoked during pregnancy. An Alberta Health and Wellness study,[7] released in 1999, examined maternal risk factors in relationship to birth outcomes, including the use of tobacco by pregnant women. Smoking was more common among younger mothers, with 60% of pregnant women under the age of 18 reporting tobacco use compared to less than 20% among those aged 35 and older.

Significant regional variations were observed. Smoking rates ranged from a low of 22% in the Calgary Regional Health Authority to a high of 55% among mothers living in the Keeweetinok Lakes Health Authority. Eleven of the seventeen regional health authorities reported a rate higher than the 28% provincial average.

Low birth weight

Smoking among Alberta women was found to be associated with a significantly increased risk of low birth weight. Almost 6.0% of live births in Alberta between 1994 and 1996 were low birth weight, and 7.5% of live births in Alberta during that time were premature.

While all smokers are at increased risk for having a low birth weight baby, risk was particularly pronounced among mothers over the age of 30.

Quitting

Only about 8% of smoking women report quitting at some point during their pregnancy. Interestingly, younger women were more likely to report quitting, despite being more likely to engage in this and other risk behaviours. Nearly 12% of women under 18 years of age reported quitting, compared to only 6% of women over 40.

Once again, geographic differences were observed. The Calgary Regional Health Authority had the second highest quit rates, despite a relatively low rate of overall prevalence among pregnant women. In contrast, the Northern health regions of the province had a greater proportion of women smoking during pregnancy and the lowest quit rates among smoking mothers. Reasons for these differences were not explored in the study.

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ECONOMIC COSTS OF TOBACCO USE

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Quick Facts

- Some of the measurable costs associated with tobacco use include direct health care costs, residential care, lost income due to premature death, disability, worker absenteeism, reduced productivity, fire damage and tobacco subsidies.
- The World Bank estimates that tobacco costs the global economy $200 billion (US) each year.
- $70 billion (US) of global losses occur in the developing world.
- Costs are high in developed nations as well; tobacco subsidies alone cost the European Union $3.8 million (US) each day in 1991.
- The revenue that tobacco generates in Canada ($7.8 billion in 1991) does not cover the costs of its use.
- In 1992, tobacco was estimated to cost Albertans $728.6 million each year, including $215.4 million in direct health care costs.
- In Alberta, a pack-a-day smoker spends almost $3,300 on cigarettes each year, based on an average cost of $9 per pack.

ECONOMIC COSTS OF TOBACCO USE

Most Canadians are well aware of the health consequences of smoking, but are they aware of the damage that tobacco inflicts on the health of the economy? Tobacco has a huge, negative impact on the world economy, resulting in the loss of billions of dollars each year. And even in Canada, where tobacco is heavily taxed, the overall costs to society are higher than the revenues that tobacco brings in.[1]

This section will examine some of the costs associated with tobacco use, both globally and domestically.

Costs Worldwide

It's estimated that tobacco costs the global economy $200 billion (US) each year.[2]

The World Bank conducted a cost analysis, weighing the economic benefits of tobacco against the costs of premature death, medical care and sick leave worldwide. Their study estimated the net loss to be $200 billion per year. They further concluded that "tobacco use is globally an economic disaster as well as an enormous economic problem in individual countries."[2] Worldwide tobacco consumption was expected to rise 1.9% by the year 2000, so losses to the world economy were predicted to escalate.[2]

Costs to Developing Nations

$70 billion (US) of global losses occur in the developing world.[3]

Until recently, developing nations enjoyed some of the revenues of tobacco without incurring many of the costs. This is because prevalence rates in many of these countries were low. But tobacco companies have begun to target developing nations (to compensate for losses in developed nations) and smoking rates have climbed. Now, the struggling economies of developing countries have to somehow accommodate the huge losses created by tobacco use.

The real cost, though, is to individuals and families. In many developing countries, a wage earner who becomes ill or dies from tobacco use leaves his or her family without an income,[3] and the state rarely offers social assistance to ease their financial burden.

Costs to Developed Nations

Costs are high in developed nations as well. Tobacco subsidies alone cost the European Union $3.8 million (US) each day in 1991.[4]

Despite huge profits for tobacco manufacturers, tobacco crops are heavily subsidized worldwide, particularly in Europe where the type of tobacco grown has little commercial value.[5]

The World Health Organization (WHO) estimates that if the European Union simply gave tobacco growers an annual salary and did not require them to grow tobacco, the amount spent on subsidies would drop by 44%.[4]

The European Union's Court of Auditors has described tobacco subsidies as a "misuse of public funds." Despite this, subsidies continue.[5]

Costs to Canadians

Costs to Canadians are high despite revenues from tobacco taxes.

The estimated revenue from tobacco taxes in 1991 was $7.8 billion.[1] So that, while Canadian smokers "pay their way" for governmental expenses such as health care ($2.7 billion in 1992), the estimated costs to society as a whole are far greater. Canadians are forced to absorb costs such as worker absenteeism, fires and lost income due to premature death.[6]

The 36,125 fires related to smokers' materials cost Canadians $433 million in property damage over a 10-year period (1988-1997).[7] In Alberta, between 1988 and 1997, the 4,841 fires related to smoker's materials cost Albertans $56 million in property damage.[7]

Estimating the Costs of Smoking

The estimated costs for Canada differ. Why?

The $9.5 billion estimate (from *The Costs of Substance Abuse in Canada*, conducted by the Canadian Centre on Substance Abuse) used conservative numbers, particularly in calculating tobacco-related mortality which they estimated to be 33,498 in 1992 (about 8,000 less than the figure that Health Canada uses for 1991). Therefore the amount estimated for lost earnings due to premature death differed from the other study by almost $4 billion. As well, the $9.5 billion estimate does not include some of the costs that the $15 billion estimate includes, such as the cost of residential care ($1.5 billion).[5]

Using the estimates from the more conservative study (*The Costs of Substance Abuse in Canada*), here is the breakdown for Canada and Alberta in 1992. This research needs to be updated so as to reflect current costs to the Alberta and Canadian economies.

The Cost of Tobacco in Canada and Alberta (1992)[6]

Cost	Canada	Alberta
Direct health care costs	$2,675,500,000 ($2.7 billion)	$215,464,000 ($215.4 million)
Direct losses associated with the workplace	$396,000	$37,000
Direct costs for prevention and research	$48,000,000 ($48 million)	$3,630,000 ($3.6 million)
Direct costs associated with fire damage	$17,100,000 ($17.1 million)	$1,211,000 ($1.2 million)
Indirect costs: productivity losses (due to death or illness)	$6,818,800,000 ($6.8 billion)	$508,247,000 ($508.2 million)
Total:	**$9.5 billion**	**$728.6 million**

Source: The Costs of Substance Abuse in Canada. Canadian Centre on Substance Abuse. 1996.

A report from the Canadian Council for Tobacco estimated the effects of a 1% reduction in smoking prevalence per year on direct health care costs in Canada. These estimates only account for direct health care costs such as hospitals, physicians, and research and do not include indirect costs such as productivity losses, reflecting a lower estimation of the actual cost. Overall, this amounted to a national cost savings of $65.7 million. The following table shows the cost-saving estimates for specific tobacco-related diseases:[3]

Disease	Decrease in the number of cases	Savings in health care costs (in millions of dollars)
Cancer of the mouth	62	1.8
Lung cancer	98	2.3
Heart disease	2,835	26.0
Cerebrovascular disease	592	19.5
Chronic obstructive pulmonary disease (COPD)	1,263	16.1
Total		65.7

Source: Canadian Council for Tobacco Control. Impact of an anti-tobacco campaign on direct health care costs in Canada. Canadian Council for Tobacco Control, Ottawa, Ontario; 2002.

High tobacco taxes help to pay for health care, but they also help to address the larger cost to society by lowering smoking rates.

Given the high price that Canadians pay for smokers, high tobacco taxes make economic sense. Not only do tobacco taxes help to pay for government costs such as health care, they help defray costs to society as a whole by lowering smoking rates, especially among teenagers who are more sensitive to price increases.

When Canadian tobacco taxes increased from an average of $0.46 in 1980 to $3.72 in 1991[9]

- cigarette sales fell 39%
- tobacco consumption decreased 30% faster than in the US (where tobacco taxes are much lower)
- smoking by teenagers was cut by two-thirds[9]

Conservative estimates suggest that a price rise of 10% on a pack of cigarettes reduces the demand for cigarettes by about 4% in high-income countries and 8% in low-income nations (where people are generally more responsive to price changes). If the price of cigarettes had been raised by 10% worldwide, the increase would have prompted 40 million smokers alive in 1995 to quit and would have prevented a minimum of 10 million tobacco-related deaths.[10]

Costs to Employers

Some of the highest costs to Canadians are paid by the business sector.

Employers who argue that they can't afford to help their employees cut down or quit smoking may not have calculated the added costs of employing a smoker. In 1997, the Conference Board of Canada estimated that it costs employers about $2,565 more per year to employ a smoker than to employ a non-smoker.[11]

Researchers conducted a cost/benefit analysis of smoking cessation programs in the workplace and found that benefits exceeded costs in each of the following areas: medical care, absenteeism, on-the-job productivity and life insurance. The study concluded that workplace cessation programs are cost-effective and prove beneficial to both the company and the community at large.[12]

Costs to Smokers

Of course, smokers pay the highest price of all.

The individual cost to a smoker's health and well-being is enormous, but financial costs are high as well. Smokers pay higher life insurance premiums and, as a group, contribute billions of dollars in taxes that non-smokers never have to pay. Smoking is also associated with the costs of physical damage (burn holes in furniture, clothes, car interiors; fires). And then there's the cost of cigarettes themselves. In Alberta, a smoker who smokes a pack a day spends almost $3,300 each year on cigarettes, based on an average price of $9 per pack.

Albertans spend more per household on tobacco products and smoker's supplies than the Canadian average. In 2000, Albertans spent an average of $609 per household on tobacco products and smoker's supplies. This is higher than Calgary ($563), Edmonton ($592), and the Canadian average ($541). However, data indicate that from 1997 to 2000 Albertans had spent less per household on tobacco products and smoker's supplies ($635 in 1997 to $609 in 2000).[13,14,15,16]

As of June 2002, the average price of a carton of 200 cigarettes in Alberta was $68.85. Saskatchewan had the highest rates at $72.72 and Ontario the lowest at $53.19.[17]

These prices have increased since 1997 when a carton of 200 cigarettes in Alberta cost $41.02, $46.23 in Saskatchewan, and $30.35 in Ontario.[18]

Tobacco use has had negative economic consequences on every level – global, domestic, sectoral and individual. An article by Warner[19] provides an in-depth literature review of the myths and realities around the economics of tobacco. The tobacco industry has claimed that a major decrease in tobacco consumption would seriously damage the economy,[19] but research shows that the measurable costs of tobacco use are high. And, of course, the real cost cannot be measured – the cost of human life.

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General Tobacco Facts

Health Canada – The Facts About Tobacco includes

- Health effects
- What makes tobacco addictive
- What influences children to smoke
- Pre and Post-Natal Issues
- The benefits of quitting
- Tips to keep children tobacco-free
- Secondhand and environmental tobacco smoke

http://www.hc-sc.gc.ca/hecs-sesc/tobacco/facts/index.html

Report from BC on Tobacco Use
http://www.healthservices.gov.bc.ca/tobacrs

AADAC – Alberta Alcohol and Drug Abuse Commission
http://www.aadac.com

Cessation

Health Canada
A variety of great resources on quitting. The site includes solid information on different nicotine replacement therapies and other alternative options to assist in cessation as well as program tips and information targeting specific audiences.
http://www.hc-sc.gc.ca/hecs-sesc/tobacco/quitting/index.html

E-Quit – Online Cessation Program
This site offers an on-line email-based quitting program.
http://www.infotobacco.com

Quitnet – A Free Resource to Quit Smoking
Offers a variety of useful ways to support smokers whenever they need it. Based on "smokers helping smokers to quit." Provides general and personalized resources for quitting.
http://www.quitnet.com/qn_main.jtml

http://www.sk.lung.ca/smoking/
Free on-line smoking cessation program for people who are and are not ready to quit, and advice for family and friends of smokers.

http://www.quitandwin.org
International website – prizes to be won for going smoke-free.

http://www.lungusa.org/ffs/index.html
An on-line version of the Lung Association's Freedom From Smoking group support program.

http://www.lung.ca/smoking/smoking_cessation.pdf
Downloadable workbook for quitting smoking.

http://www.nstep.org/resources/cessation/users.html
Spit tobacco cessation tips.

http://www.quittobacco.com/
Spit tobacco and smoking cessation programs and aids.

http://quitsmoking.about.com/
Find help for kicking a smoking habit and staying nicotine-free. Also check out related news and information.

http://www.nau.edu/~fronske/broch.html#smoke
Self-help guides for quitting smoking.

Youth and Smoking

http://www.tobaccofacts.org
There are prevention resources but there are also resources for smokers who want to quit (follow the SMOKERS link at the top).

http://www.ayn.ca/quit/en/home.asp
A Tribe Called Quit – an Aboriginal site for youth on traditional tobacco use and abuse. Has a video on-line, chat rooms and resources.

http://www.cdc.gov/tobacco/index.htm
Lots of good tips, information and fact sheets

http://www.cdc.gov/tobacco/educational_materials/iquit.htm
A guide for youth on how to quit.

http://www.health.gov.ab.ca/public/document/tobacco/tobacom.htm
Tips to keep your kids tobacco-free.

http://www.quit4life.com/html/splash.html
Quit Smoking information for youth.

http://www.crha-health.ab.ca/pophlth/tobacco/youth.htm
Calgary site for youth – with many resources and links.

http://www.notobacco.org/
Multimedia information and good links to resources.

http://www.4woman.gov/QuitSmoking/teens.cfm
A site for young women who are trying to quit.

http://www.tobaccofreekids.org/
Exposes the tactics industry uses to hook teens. Includes a tobacco ad gallery, fact sheets and latest news.

http://www.media-awareness.ca/eng/med/class/teamedia/smointro.htm
Promotes media literacy about tobacco targeting youth, grades 6-9.

http://www.lung.ca
Information on quitting and on the health effects of smoking.

http://www.hc-sc.gc.ca/hecs-sesc/tobacco/youth/index.html
Health Canada website for youth. Includes information and tips for quitting. Raises awareness about the tobacco industry.

Spit Tobacco

http://www.nstep.org
National Spit Tobacco Education Program.

http://www.health.gov.sk.ca/rr_smokeless_tobacco.html
Facts about spit tobacco.

http://www.familydoctor.org/handouts/177.html
Factual handout on how to quit using spit tobacco.

http://www.sinuscarecenter.com/tobchaao.html
Highlights the dangers of using spit tobacco.

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